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Human Development Unit
Caribbean Country Management Unit
Latin America and the Caribbean Region

NON-COMMUNICABLE DISEASES IN JAMAICA: MOVING FROM PRESCRIPTION TO PREVENTION



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CURRENCY EQUIVALENTS

Currency Unit: Jamaica Dollar (JMD)
Market Mid-Rate In 2008:
1.00 US dollar: 74.75 Jamaica Dollars
One Jamaica Dollar: 0.01338 US Dollars
Fiscal Year: April 1- March 31

ABBREVIATIONS & ACRONYMS

API	<i>Active Pharmaceutical Ingredients</i>
CARICOM	<i>The Caribbean Community and Common Market</i>
CIA	<i>Central Intelligence Agency</i>
CSO	<i>Civil Society Organization</i>
DALY	<i>Disability-Adjusted Life Year</i>
FCTC	<i>Framework Convention on Tobacco Control</i>
GDP	<i>Gross Domestic Product</i>
HALE	<i>Health Adjusted Life Expectancy</i>
HIV/AIDS	<i>Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome</i>
ICT	<i>Information and Communications Technology</i>
JADEP	<i>Jamaica Drug for the Elderly Program</i>
JHLS	<i>Jamaica Health and Lifestyle Survey</i>
JSLC	<i>Jamaica Survey of Living Conditions</i>
KMA	<i>Kingston Metropolitan Area</i>
LAC	<i>Latin America and the Caribbean</i>
MOHE	<i>Ministry of Health and Environment</i>
NCDs	<i>Non-Communicable Diseases</i>
NGO	<i>Non-Government Organization</i>
NHF	<i>National Health Fund</i>
NLTA	<i>Non-Lending Technical Assistance</i>
OECD	<i>Organization for Economic Cooperation and Development</i>
UN	<i>United Nations</i>
UWI	<i>University of the West Indies</i>
WDI	<i>World Development Indicators</i>
WHO	<i>World Health Organization</i>

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EXECUTIVE SUMMARY

The countries of the Caribbean region have experienced a rapid and complex epidemiological transition in the past decades. Chronic diseases are the leading causes of death throughout the Americas, but the epidemic has hit the Caribbean region particularly hard. Recognizing the threat of Non-Communicable Diseases (NCDs), heads of government of the Caribbean Community and Common Market (CARICOM) convened a Regional Summit, “Stemming the Tide of Non-Communicable Diseases”, on September 15, 2007, which called for comprehensive and integrated prevention and control strategies aimed at containing the emerging epidemic of NCDs.

Jamaica is a Caribbean country that has initiated comprehensive programs to address NCDs. The government created the National Health Fund (NHF) to reduce the cost of treatment of NCDs and finance some prevention programs.

The main objective of this study is to learn from Jamaica’s experience in tackling major NCDs and related risk factors, to provide policy options for Jamaica to improve its NCD programs and to share with other countries the lessons learned from its experience.

The study attempts to answer three questions: (i) whether the NHF and its drug subsidy program have reduced out-of-pocket spending on NCDs; (ii) whether access to treatment of NCDs has improved; and (iii) what the economic burden on NCD patients and their families is.

The report presents an overall picture of the epidemiological and demographic transitions in Jamaica, its current burden of NCDs, and the change in the trend of NCDs in the past decade, using publicly available data, particularly data from the Jamaica Living Condition Household Surveys. It assesses the risk factors and analyzes Jamaica’s response to NCDs with emphasis on the impact of the National Health Fund on people’s lives. Estimates of the economic burden of NCDs are provided and policy options to improve Jamaica’s NCD programs are suggested.

Main Findings

NCDs impose an increasing burden on the population’s health in Jamaica. Jamaica is undergoing a demographic transition and an epidemiological transition similar to that of nearly all other countries in the Caribbean region. Its population is aging and will continue to do so because of declines in the rates of fertility and mortality. Jamaica is carrying a double burden of both communicable diseases and NCDs.

NCDs have spread progressively among the entire population in the last decade and are the leading cause of mortality and

morbidity, accounting for the largest number of hospital discharges. This rapidly increasing trend exhibits vast disparities among socioeconomic subgroups, especially between males and females, as the prevalence of NCDs among females has increased faster than among males. Most prevalent NCDs are hypertension, diabetes and asthma. Patterns of a specific disease vary considerably by socioeconomic subgroups, with females, seniors, and rural residents at higher risk.

Unhealthy diet, physical inactivity, smoking, and harmful alcohol consumption are major risk factors. Obesity, mainly the result of unhealthy diet and lack of physical activity, is the most prevalent NCD, particularly among adult women. Women are far less physically active than men in all age groups. Globalization and urbanization have contributed to unhealthy eating behavior such as eating out, eating more staple foods and fewer vegetables and fruits, and consuming sugar-saturated soft drinks and fast food. The proportion of physically inactive adults has doubled over the last decade. The prevalence of smoking is relatively high in all age groups but more so among men and the poorer population. Household tobacco expenditure has shown a steady increase from 2000 to 2008. Economically better-off households spend more on tobacco but both poor and rich households alike show a growing trend in tobacco use between 2000 and 2008. This trend is partly due to smokers forming their smoking habit at a very young age with easy access to local tobacco products. Finally, excessive alcohol consumption is alarming, with males consuming more alcohol than females. Poor regulations and generally relaxed societal attitudes reinforce this trend.

Reducing the burden of NCDs in Jamaica is a national policy. The government of Jamaica has recognized the importance of preventing and controlling NCDs and created the NHF to reduce the cost of treatment of NCDs by providing free or subsidized medicines to patients with NCD conditions. The NHF also financed various prevention programs to promote healthy lifestyles and to reduce exposure to the risk factors that lead to NCDs.

The government’s policy and program on NCDs has shown positive results and access to treatment has improved. Coverage of these programs is, however, still limited and uneven and the NHF has not effectively reached the poor. More people are seeking care by visiting the provider of their choice, more are spending less on pharmaceuticals but more on doctor’s fees and laboratory tests, and more are using private sector facilities. Coverage of NHF and JADEP (Jamaica Drug for the Elderly Program) cards remain limited and uneven, however, despite broad awareness among Jamaicans. The NHF has made some NCD drugs more affordable but the distribution of NHF benefits is unequal among socioeconomic groups. The economically better-off population group appears to benefit more from the government subsidy of pharmaceuticals and is more likely to enroll in the NHF program. The richest 20 percent of the population with NCDs were estimated to spend sevenfold more than the poorest 20 percent, suggesting the need for the program to more effectively target the poor and extend their enrollment in it.

The NHF drug subsidy program has achieved its primary goal of making NCD drugs more affordable. This study assesses the initial impact of the NHF drug subsidy program in reducing out-of-pocket spending on healthcare by NCD patients and in utilizing healthcare, comparing NCD patients with non-NCD patients. The results from the analysis of the Household Surveys before and after the establishment of the NHF indicate that NCD patients under the NHF paid less out of pocket for their pharmaceuticals than NCD patients without NHF cover.

NCDs have resulted in a large direct and indirect economic burden for individuals in Jamaica. An average individual suffering from an NCD spends approximately one-third of household income (JMS 55,503) on healthcare services and pharmaceutical purchases. Direct healthcare costs associated with NCDs are regressive and impose a greater burden on poor households than better-off households.

Priorities to Strengthen the National Response to NCDs

The preliminary analysis of Jamaica's NCD policy and programs indicates that the drug subsidy program supported by the NHF has helped NCD patients reduce their spending on treatment. There is little evidence indicating that the trend of NCDs is declining, and much more needs to be done to stop and reverse the increasing trend. The impact of prevention programs supported by the NHF has been limited. Treating patients by prescribing drugs at a lower cost to the patient is a worthwhile objective but preventing the disease from occurring is more cost effective.

Jamaica may consider the following policy options and interventions for enhancing its NCD prevention and control programs:

- Build a comprehensive National Strategy on NCDs. The determinants of NCDs are based on behaviors and social conditions that require a comprehensive, multilevel, and multisector strategy. Reversing the NCD epidemic in Jamaica requires a National Strategy that combines the three levels of prevention. The focus so far has been more on clinical interventions by prescribing and subsidizing medications and less on population-based primary prevention. The National Strategy will need to put population-based prevention at center stage and define achievable and measureable goals with specified time frames.
- Expand the financing sources for implementing the NCD strategy and improve the financial sustainability of the NHF. The costs to the healthcare system from NCDs are high and are likely to increase. Government budgets and the NHF are the primary sources of financing NCD prevention and treatment. Increasing financing for NCD prevention and treatment is a fiscal challenge due to the impact of the global financial crisis. Implementing a more comprehensive NCD strategy will require more funds. The NHF is a well-organized entity. It may be possible to finance the NHF out of general taxation or by linking its financing to payroll taxes. These measures would make the fund more sustainable to be able to meet the increasing needs for prevention and treatment. Other methods for mobilizing resources could be through expanding public-private partnerships.
- Improve efficiency of the NHF by: (1) assessing the prevention programs financed by the NHF and their effectiveness; (2) striking the appropriate balance between prevention and drug subsidy programs; and (3) improving targeting of the poor under the drug subsidy programs. Activities could focus on geographic areas where poverty, disease, and violence are concentrated and areas where the poor population would benefit from NHF coverage.
- Reduce the risk factors through policy interventions. Legislation and regulations are needed to control tobacco and alcohol production and use, and to reduce trans-fat and salt intake by working with manufacturers and the food production industry to provide a healthy food supply.
- Improve the surveillance system to monitor the risk factors and NCDs. The dearth of reliable registration and reporting of cause-specific mortality and morbidity makes targeting difficult. Improved information on risk factors is a necessary first step in order to feed data into the NCD policy dialogue. Health information systems need to be developed to collect and report data on risk factors, mortality, morbidity, and the determinants of NCDs.
- Evaluate the effectiveness of policies, strategies, and interventions. There is a need to refine target groups and accelerate, adjust, or change interventions as a necessary process of learning from results on the ground.
- Policies should target prevention actions at primary, secondary, and tertiary levels. Primary prevention aims to prevent exposure to the risk factors that cause NCDs. These may include policies on anti-smoking, encouraging physical activity, promoting a healthy diet, and reducing harmful use of alcohol. Secondary prevention strategies attempt to diagnose and treat an existing disease in its early stages before it results in significant morbidity. Policy options to be considered at the secondary level of care include adopting new care models such as Disease Management Programs and integrated care models, strengthening the surveillance on NCDs, and using information and communications technology such as electronic patient records and clinical decision support systems. Tertiary prevention aims to reduce the negative impact of an established disease by restoring function and reducing disease-related complications. Activities at this level should focus on avoiding complications and preventing the progress of the disease.

- Address the gender dimension when targeting. Women and men are exposed to risk factors to a different degree. Men are more likely to use tobacco and consume alcohol in excess, while women are more likely to be obese and physically inactive. Health promotion programs need to target gender-specific risk factors using tested methodologies.
- Reorient the health services delivery system of physical, human, and financial resources to adopt new care models. Learn from other countries how they are using Disease Management Programs and integrated care models that hold promise for more effective approaches towards improving health outcomes of NCD patients, as well as potentially containing costs and increasing patient satisfaction.
- Adopt a multisector approach for NCD prevention and control by involving non-health ministries, civil society organizations, and the private sector. Jamaica has a wealth of experience in controlling the HIV/AIDS epidemic and this knowledge can be applied in NCD prevention and control. Civil society organizations and the private sector can play critical roles in preventing unhealthy diets, encouraging physical activities, and discouraging tobacco use and excessive use of alcohol. The business communities can contribute to both financing and implementing NCD prevention.

INTRODUCTION

This Introduction sets out the objectives and structure of this Report.

Objectives of the Report

This report aims to extend the World Bank's existing knowledge base on NCDs by analyzing how NCDs are impacting Caribbean countries. The report is part of the multi-year Non Lending Technical Assistance (NLTA) program, which began in the 2009 fiscal year and is continuing through the 2011 fiscal year. The NLTA and this report in particular aim to provide knowledge and evidence for designing policies and interventions to prevent and control NCDs. This study focuses on Jamaica's experience in addressing major NCDs and their related risk factors with the objective of learning from Jamaica and providing policy options to Jamaica to improve its programs. This forms part of the overall objective of the NLTA program to support Caribbean countries in addressing the growing threat posed by the major NCDs by:

- increasing the understanding of current strategies and programs for NCD prevention and control in the region, including an assessment of their adequacy and likely impacts;
- identifying good practices for addressing NCD risk factors;
- providing policy recommendations to improve prevention and treatment programs; and
- advising on improvements in financing mechanisms to cope with the rising costs due to NCDs.

The World Bank's interest in recent years in improving this knowledge base results from the impact that NCDs are having on the health, population, and economies of developing countries. The Bank recognizes the economic and social urgency for preventing and controlling NCDs globally and has accumulated knowledge and experience to support countries in understanding the risk factors contributing to NCDs and in taking action to address them. This report adds knowledge from the Caribbean region on NCDs to various reports already compiled, including the seminal World Bank report published in 2007 entitled "Public Policy and the challenge of non-communicable diseases" (Adeyi, Smith and Robles 2007); an early analysis of Chile (The World Bank 1995); and studies on NCDs in Brazil (Danel, Kurowski and Saxenian 2005), the Russian Federation (The World Bank 2005), the MENA region (The World Bank 2010), and the South Asia region (The World Bank 2010); as well as a survey in 25 countries in Latin America and the Caribbean that made policy recommendations for further regional action (Godinho 2006).

Jamaica¹ was selected as a typical country in the Caribbean for the purpose of preparing the NCD Study in the Caribbean Region. Like most Caribbean countries, Jamaica is transitioning demographically and epidemiologically from the earlier communicable disease phase to what is now a predominantly NCD phase. Nevertheless, it still has to cope with two chronic communicable diseases: HIV/AIDS and tuberculosis. Jamaica was selected for this case study because Jamaica has created mechanisms, notably the National Health Fund, 2003, (NHF) to assist individuals to purchase prescription drugs for managing and treating chronic illnesses and has since 2003 subscribed to the United Nations Framework Convention on Tobacco Control. Jamaica has a rich database from the last twenty years – the Jamaica Survey of Living Conditions (JSLC) – that provides an opportunity to assess level of access and cost of care for NCDs before and after establishment of the NHF. Lessons can be learned from Jamaica's experience that may be useful to other Caribbean islands as well as to middle-income countries in other regions.

Structure of the Report

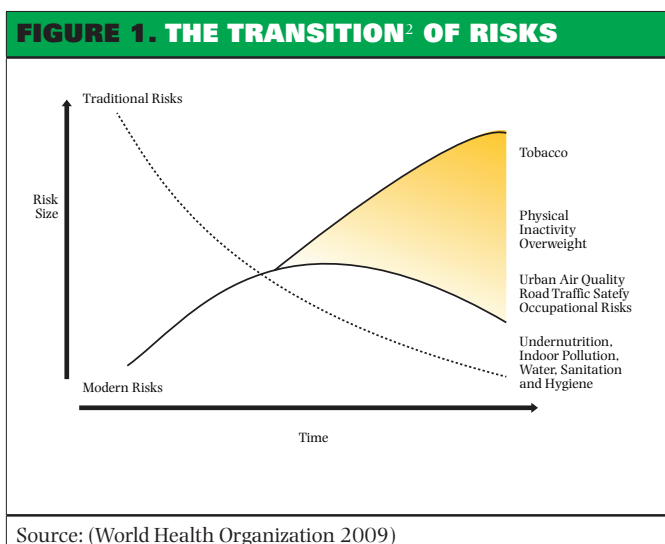
This report is structured in nine chapters. Chapter 1 briefly reviews the global burden of NCDs. Chapter 2 lays the groundwork for a detailed analysis of NCDs in Jamaica. It introduces the conceptual framework for this study and reviews the demographic and epidemiological transitions that have occurred in the past decades. Chapter 3 presents the current burden of disease in the context of past trends of NCDs. Major risk factors contributing to NCDs in Jamaica are analyzed in Chapter 4. Chapter 5 presents Jamaica's response to NCDs with a focus on the role of the NHF and the Healthy Lifestyles Prevention Program. Chapter 6 assesses how NCDs affect people's lives and evaluates the impact of the NHF on their lives. Chapter 7 examines the economic implications of NCDs. Chapter 8 draws upon the experience of other countries to combat NCDs and, finally, Chapter 9 suggests policy options that would further strengthen Jamaica's National NCD Strategy and Programs.

¹ Jamaica is an island nation established as an independent state in 1962 within the Commonwealth of Nations. With 2.8 million people, it is the third most populous Anglophone country in the Americas, after the United States and Canada.

1. THE GLOBAL AND REGIONAL BURDEN OF NON-COMMUNICABLE DISEASES

This chapter sets out the burden of NCDs both worldwide and on the Caribbean region and describes a regional approach for dealing with NCDs.

NCDs are the leading cause of morbidity and mortality worldwide. The top causes of death in the world include coronary heart disease, stroke and other cerebrovascular diseases, cancer, and chronic obstructive pulmonary disease. NCDs affect human capital, cause direct losses to productivity, and increase healthcare costs. Urbanization, changing lifestyles, globalization, and living longer increase the demand on health services, increase the resources allocated to prevent and treat NCDs and place a hefty burden on health systems. Figure 1 shows the decrease in traditional risks and the vast increase in modern risks.



NCDs are also among the leading risk factors contributing to mortality in middle-income countries. Risk factors associated with NCDs are well known and have been studied extensively. The most notable ones on a global scale include high blood pressure, tobacco

use, and overweight and obesity. Table 1 shows the ten leading risk factors that cause death in middle-income countries.

TABLE 1. TEN LEADING RISK FACTORS CONTRIBUTING TO DEATH IN MIDDLE INCOME COUNTRIES, 2004

RISK FACTOR	DEATHS (MIL-LIONS)	% OF TOTAL
1. High Blood Pressure	4.2	17.2
2. Tobacco Use	2.6	10.8
3. Overweight And Obesity	1.6	6.7
4. Physical Inactivity	1.6	6.6
5. Alcohol Use	1.6	6.4
6. High Blood Glucose	1.5	6.3
7. High Cholesterol	1.3	5.2
8. Low Fruit and Vegetable Intake	0.9	3.9
9. Indoor Smoke From Solid Fuels	0.7	2.8
10. Urban Outdoor Air Pollution	0.7	2.8

Source: Global Health Risks (World Health Organization 2009)

NCDs have a negative economic impact on individuals and society. The costs of NCDs include both the direct costs for individual health expenditure as well as the indirect costs derived from loss of earnings and the economic burden on families, communities, and private and public healthcare systems. NCDs are responsible for a growing portion of health spending and, as the increasing trend of their prevalence continues, it will become progressively more difficult to sustain current healthcare systems (Alleyne 2007). A 2005 World Bank study on NCDs in Brazil estimated that economic costs over the 2005–2010 period would equal approximately 10 percent of GDP (International Diabetes Federation n.d.); productivity losses are estimated at US\$71.5 billion, and treatment costs at US\$34 billion. These account for 50 percent of hospital costs and 70 percent of national health service costs.

THE BURDEN OF NCDs IN THE CARIBBEAN REGION

The burden of NCDs has escalated in the Caribbean region with five times as many people dying from NCDs as from all other illnesses combined. Ten times more people are dying from NCDs than from HIV/AIDS. NCDs represent not only the major causes of death, but are responsible for the greatest share of the burden of disease in the Caribbean region (65 percent) (PAHO/CARICOM 2006). The four leading causes of death in the Caribbean in 2000 were all NCDs – heart disease, cancer, stroke, and diabetes. These four conditions accounted for 47 percent of deaths in 1980 and 51 percent in 2000 (PAHO/CARICOM 2006). In 2004, cardiovascular disease alone was responsible for 35 percent of all deaths and 68 percent of the total disease burden in Latin America and the Caribbean region (Glassman, et al. 2010). Partly as a result of the demographic and epidemiological transitions, NCDs have shown an upward trend in being the most common cause of death from 1985

² Over time, major risks to health shift from traditional risks (e.g. inadequate nutrition or unsafe water and sanitation) to modern risks (e.g. overweight and obesity). Modern risks may take different trajectories in different countries, depending on the risk and the context.

to 2000 (Ivey, et al. 2008). The major NCDs in the Caribbean share common underlying risk factors, such as unhealthy eating habits, lack of physical activity, obesity, excessive tobacco and alcohol use, and inadequate utilization of preventive health services.

A SUPPORTING AND ENABLING ENVIRONMENT TO ADDRESS NCDs IN THE CARIBBEAN

The governments across the Caribbean region have acknowledged the threat of NCDs. On September 15, 2007, the heads of government of the CARICOM Community subscribed to the Port-of-Spain Declaration titled “Uniting to Stop the Epidemic of Chronic NCDs”, which outlined 15 actionable points to stem the tide of NCDs in the Caribbean.

This commitment at the highest levels is supported by a base of technical and human resources directly targeting NCD issues and serving as regional focal points. A Regional Strategic Plan on NCD Prevention Control for the Caribbean Community 2011–2015 has been developed, after a comprehensive consultation process, and examines components crucial to curtailing the epidemic of NCDs in the Caribbean. These include risk factor reduction, health promotion, surveillance, disease management, public policy, advocacy, communications, patient education, and program management. The Plan helps to guide regional and country-level responses to NCDs. These factors, along with the strong interest from international organizations in supporting the region in its response to NCDs, provide an enabling environment to support efforts to respond effectively to NCDs in the region.

Having considered the global and regional situation, the next chapter will consider the effect of the demographic and epidemiological transitions in Jamaica as a basis for future chapters which deal with the burden placed on the country by NCDs

2. THE EFFECT OF DEMOGRAPHIC AND EPIDEMIOLOGICAL TRANSITIONS ON NCDs IN JAMAICA

This chapter deals directly with the situation of NCDs in Jamaica, setting out the conceptual framework to be used for analyzing NCDs in the country, and gives details of Jamaica's demographic and epidemiological transitions.

Key Findings

1. Jamaica faces a double burden of disease: the continued challenge of communicable diseases coupled with the emergence and preponderance of NCDs. Communicable diseases were the greatest contributor to Jamaica's burden of disease in the 1960s and 1970s but were surpassed by NCDs in the 1980s and 1990s. NCDs are currently the leading causes not only of mortality but also of morbidity, and their prevalence increased in the last decade.
2. Women in Jamaica are having fewer children than in previous generations. Jamaica's total fertility rate has reduced from nearly 6 children per woman in the 1960s to 2.4 in 2008.
3. Jamaicans are living longer lives with life expectancy doubling and death rates declining. Life Expectancy at Birth was an average of 38 years in the 1900s, which has almost doubled to 74.1 years in 2008.
4. Jamaica's population is aging as reflected in the changing age structure of the population, with a declining 0–14 age group, an increasing working age population (15–64), and a growing dependent elderly age group (65+).
5. With Jamaicans living longer and death rates declining, this longer-living population will have greater lifetime exposure to NCD risk factors.
6. Jamaica has advanced significantly in its epidemiological transition with 63 percent of the burden of disease (measured by Disability Adjusted Life Year) due to NCDs and 13 percent due to injuries.

CONCEPTUAL FRAMEWORK FOR ANALYZING NCDs IN JAMAICA

Low- and middle-income countries struggle to adapt their healthcare systems to address the now-predominant burden of NCDs. Vertical disease programs have been successful in controlling and even eliminating some communicable diseases but are not necessarily effective in tackling NCD conditions. Lessons learned from some high- and middle-income countries show that the strategy for NCD control has to be comprehensive, multilevel, and multisectoral.

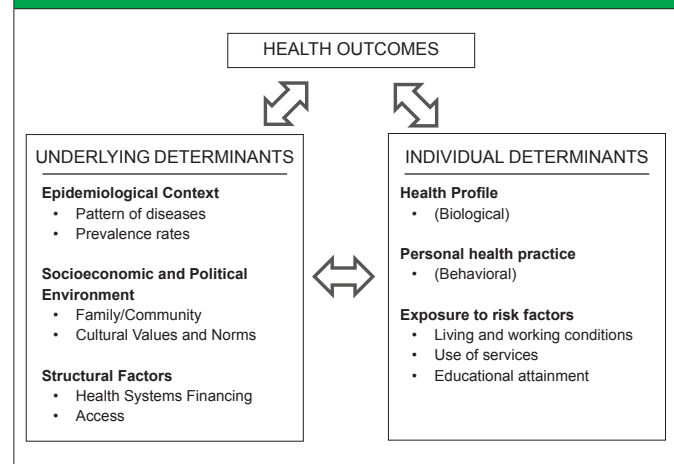
Understanding of disease prevention and control has evolved from being a narrowly defined medical responsibility to one that is a more complex social phenomenon. First, the determinants of NCDs lie in behaviors and social conditions, rather than being the result of single biological causes. Second, these chronic conditions are not once-off or episodic events; they build up over long periods of time leading to disease progression that is accelerated with aging or cumulative exposure to health risks. Third, people who acquire multiple risk factors and diseases need lifelong disease management. Fourth, the complexity of managing and preventing these diseases requires interventions at multiple levels from multiple actors, ranging from behavior changes to tertiary medical care. An effective response to NCDs requires the involvement of the entire healthcare system.

A conceptual framework has been used to help identify the major determinants of NCDs, clarify the relationships among different determinants, and examine the scope and limitation of policy interventions. This approach enables further assessment of relationships, identification of gaps, and understanding of the impact on final outcomes. In such a framework, those aspects of the health system and social environment that can influence the overall health status of the population are illustrated in Figure 2. Here, both health policy and health profile can be seen to directly affect the use of health services, which in turn influences health outcomes for individuals. The organization of primary care settings determines the responsiveness of countries to their health situation, yet this relationship can be modified by the social environment, represented here by characteristics of the patients and personal health practices. It may not be possible to delimit with absolute certainty the health system from the social environment, but it is possible to identify determinants of both systems.

The conceptual framework for this case study builds upon previous analyses of diseases and pathways through which social and environmental conditions as well as individual factors influence health outcomes. A vast amount of literature has been developed in recent years on the determinants of health (Evans, et al. 2001), (Lurie and McLaughlin 2003), (Solar and Irwin 2007). The role of individual and social determinants and the interactions between them have been identified. The impact of different determinants has been further distinguished by the role of structural and intermediary determinants (Solar and Irwin 2007) and primary and secondary determinants. Primary determinants

include socioeconomic and demographic factors while secondary determinants encompass biological and lifestyle factors (Kosteniuk and Dickinson 2003). Sassi and Hurst, in their Economic Framework for the Prevention of Lifestyle-related Chronic Diseases, emphasize the importance of interactions between individual factors and specific socioeconomic environmental influences; the framework they developed focuses on preventing lifestyle-related NCDs (Sassi and Hurst 2008). The various conceptual frameworks developed by researchers provide relevant structures and elements for analyzing the determinants of NCDs.

FIGURE 2. CONCEPTUAL FRAMEWORK FOR ANALYZING DETERMINANTS OF NCDs



This study adopts a framework that groups the factors that influence health and the burden of disease into “underlying” and “individual” sets of determinants. Underlying determinants affect the health of the population at the macro level while individual determinants affect individual health at the micro level. This distinction highlights the role that individuals can play in the prevention and control of NCDs while identifying the socioeconomic environment that influences individual behavior and which can be changed by policy interventions. The aim of this framework is not to capture the comprehensive relationships between the determinants of NCDs nor to test these relationships, but rather to raise awareness of them for a better understanding of the pathways that lead to NCDs.

In applying this framework to the Jamaica case, this study identifies three elements that are emphasized in the National Strategy for addressing NCDs. These are: (a) strengthening a public network of health services to increase access to care; (b) establishing a drug subsidy program to facilitate treatment of chronic conditions; and (c) conducting health promotion programs to influence personal health practice and prevent disease as well as progression of disease. This study attempts to provide a better understanding of whether these policies have increased the use of health services and ultimately affected health outcomes.

The study is also guided by the PAHO/WHO framework on Essential Public Health Functions “to improve, promote, protect, and restore the health of the population through collective action.” PAHO/WHO defined the following eleven Essential Public Health Functions:

1. Monitoring, evaluation, and analysis of health status
2. Surveillance, research, and control of the risks and threats to public health
3. Health promotion
4. Social participation in health
5. Development of policies and institutional capacity for public health planning and management
6. Strengthening of public health regulation and enforcement capacity
7. Evaluation and promotion of equitable access to necessary health services
8. Human resources development and training in public health
9. Quality assurance in personal and population-based health service
10. Research in public health
11. Reduction of the impact of emergencies and disasters on health

Finally, the study reviews policy options under two levels of prevention:

- Primary prevention is directed at the prevention of illnesses by removing their causes. The target group for primary prevention is people who are healthy with respect to the target disease. Population-based interventions cover the whole population and aim to prevent the adverse health event from occurring in the first place. These programs promote lifestyle changes to reduce obesity, smoking, and excessive alcohol consumption, promote physical activity, and reduce other related risk factors that contribute to NCDs.
- Secondary prevention aims at identifying the disease at an early stage so that it can be treated. This enables cure, or prevents further deterioration. The target group for secondary prevention consists of people who are already ill without being aware of it or those who are at increased risk or who have a genetic predisposition. Individual clinical interventions for high-risk patients with several risk factors present include medical attention, treatment, and follow-up in order to prevent an existing condition from deteriorating into an incapacitating or fatal result.

THE DEMOGRAPHIC TRANSITION IN JAMAICA

Jamaica’s population is aging as reflected in the changing age structure of the population. Three trends characterize Jamaica’s population structure: a declining 0–14 age group, an increasing working age group (15–64), and a growing 60+ age group that is now the fastest-growing segment of the population. The population was estimated at 2,692,400 at the end of 2008 and the

annual population growth rate has remained consistently below 1.0 percent since 1998. The gender composition has remained unchanged since 2004 but the male/female ratio starts decreasing after the 0–14 age group.

Women in Jamaica are having fewer children than in previous generations. Jamaica’s total fertility rate was reported to be 2.4 in 2008, similar to the rate for the whole Caribbean region.

Jamaicans are living longer lives. Contributing to the epidemiological transition is a reduction in mortality and illness from infectious diseases that has increased life expectancy at birth from 38 years in 1900 to 74.1 years in 2008. The crude death rate was 35.7 per 1,000 population and the infant mortality was 174.3 per 1,000 live births in the 1900s (Figueroa, 2001). The rates declined to 6.3 deaths per 1,000 population and to 21.3 infant deaths per 1,000 live births in 2008 respectively (Ministry of Health Jamaica 2009). The net effect of increasing life expectancy and falling crude death rates and infant mortality rate is a longer-living population affected by an increased mortality and morbidity burden due to NCDs.

The age dependency ratio has continued to decline as reflected in a ratio of 73 dependent persons per 100 persons of working age in 1997, compared with 66 per 100 in 2007.

The demographic transition has important health consequences. A long-lived population will have greater lifetime exposure to risk factors such as tobacco, alcohol, and fatty foods, which contribute to heart disease, stroke, and various forms of cancer. In addition, a lifestyle of limited exercise may contribute to deteriorating health in later years through osteoporosis, muscle thinning, and inadequate cardiac condition (Butler 1997).

THE EPIDEMIOLOGICAL TRANSITION IN JAMAICA³

Jamaica faces a double burden of disease: the continued challenge of communicable diseases coupled with the emergence and preponderance of NCDs. Communicable diseases were the greatest contributor to Jamaica’s burden of disease in the 1960s and 1970s but were surpassed by chronic diseases in the 1980s and 1990s. Epidemiological transitions occur through urbanization and lifestyles changes as living standards improve, education levels rise, access to health services increases, and morbidity and mortality patterns change with people living longer lives.

Changing lifestyles contribute to high rates of NCDs. More than 50 percent of Jamaicans can be categorized as overweight and obese with higher rates among women. In addition, using waist circumference measurements, women are at higher risk of cardiovascular disease than men; 70 percent of women have an increased waist circumference compared to 20 percent of males (Wilks, et al. 2008). Policies and programs focusing on NCDs need

³ The primary data sources for the analysis of the epidemiological transition and of the morbidity and mortality caused by NCDs are from the Ministry of Health, WHO, and peer-reviewed journals.

to understand lifestyle and behavior choices in order to address the conditions leading to these high rates.

Women from poorer segments of the population are more likely to be at risk of NCDs. More women with low incomes are uninsured or underinsured, and cannot afford preventive screenings for high blood pressure, high cholesterol, or diabetes, which limits early detection of cardiovascular and other NCDs. Hypertension, diabetes, and hypercholesterolemia are reported more frequently for adult women than for men at prevalence rates of 29.3 versus 10.7 for hypertension, 9.1 versus 6.1 for diabetes, and 4.9 versus 2.6 for high cholesterol for women and men respectively in Jamaica (Wilks, et al. 2008).

NCDs are now the leading causes of mortality and morbidity. Within the Caribbean, the burden of NCDs is particularly acute in Jamaica, where NCDs accounted for 60 percent of the burden of disease in 2002 when the country reported its four leading causes of death to be NCDs. Prevalence of diabetes in Jamaica is 11 percent. This surpasses the Caribbean regional prevalence rate, which ranges from 6 to 8.5 percent, already higher than world estimates of 6.8 percent (International Diabetes Federation n.d.). On a global scale, Jamaica ranked 59th in the percentage of Years of Life Lost due to NCDs and ranked fourth in the Caribbean, together with Grenada, at 66 percent of years of life lost, after Cuba, Antigua and Barbuda, and Dominica (Table 2).

TABLE 2. YEARS OF LIFE LOST TO NCDs (%), 2002

RISK COUNTRY	GLOBAL RANKING (OUT OF 195 COUNTRIES)	% OF YEARS OF LIFE LOST (PER 100,000 POP.)
Cuba	43	73
Antigua and Barbuda	50	69
Dominica	53	68
Grenada	58	66
<i>Jamaica</i>	59	66
Barbados	60	65
St. Lucia	69	63
St. Kitts and Nevis	71	62
St. Vincent and the Grenadines	78	60
Trinidad and Tobago	102	50
Bahamas	106	45
Suriname	108	45
Belize	118	41
Dominican Republic	129	33
Guyana	131	30
Haiti	153	15

Source: WHO Data at <http://data.un.org>

Four out of the five leading causes of death in Jamaica are NCDs: namely cerebrovascular disease, diabetes mellitus, ischemic heart disease, and hypertensive heart disease (Table 3). The PAHO Country Health Profile (PAHO 2001) indicates that in 1999 diabetes accounted for one of every nine deaths, and the rate of diabetes among women increased from 51.8 per 100,000 population in 1990 to 59.9 in 1999. Breast and cervical cancers were the leading causes of cancer mortality in the 20–59 age group. The leading cause of hospital deaths for the elderly in 1999 was cardiovascular disease, followed by diseases of the respiratory system. The main NCDs and risk factors affecting the elderly were hypertension, arthritis, overweight, and diabetes.

TABLE 3. TOP TEN CAUSES OF DEATH, ALL AGES, JAMAICA, 2002

CAUSES	DEATHS (%)	YEARS OF LIFE LOST (%)
All causes	100	100
Cerebrovascular disease	18	11
Diabetes mellitus	11	8
Ischemic heart disease	10	6
Hypertensive heart disease	6	4
Lower respiratory infections	4	4
HIV/AIDS	4	9
Stomach cancer	3	2
Nephritis and nephrosis	3	3
Perinatal conditions	2	8
Breast cancer	2	3

Source: (World Health Organization 2002)

NCDs account for the highest number of hospital discharges. In 2007, the highest number of hospital discharges (including deaths) were patients with circulatory diseases, malignant neoplasms, endocrine and nutritional diseases, respiratory diseases, injuries and accidents, and infectious and parasitic intestinal diseases. Of these six, the top four diseases share nutrition and lifestyle behavior as underlying determinants. Diseases of the respiratory tract, including upper and lower respiratory tract infections and asthma, were the leading cause for out-patient visits.

Of the burden of disease as measured by Disability Adjusted Life Years (DALYs), 63 percent is due to NCDs and 13 percent to injuries. Table 4 highlights the percentage of DALYs caused by NCDs in Jamaica, roughly threefold that caused by communicable diseases. Table 5 provides further details on the NCDs most affecting the Jamaican population by displaying a list of the top ten specific causes of DALYs.

TABLE 4. ESTIMATED DALYS PER 100,000 POPULATION, 2004

ALL CAUSES	DALYs	%
	16,314	100
Communicable, maternal, perinatal and nutritional conditions	3,893	24
Infectious and parasitic diseases	2,001	12
Respiratory infections	395	2
Maternal conditions	458	3
Perinatal conditions	792	5
Nutritional deficiencies	247	2
NCDs	10,250	63
Neuropsychiatric conditions	3,477	21
Cardiovascular diseases	1,744	11
Malignant neoplasms	1,043	6
Respiratory diseases	952	6
Sense organ diseases	859	5
Other*	2,175	13
Injuries	2,170	13
Unintentional injuries	807	5
Intentional injuries	1,363	8
Source: World Health Organization 2004 (World Health Organization n.d.)		
*includes other neoplasms, diabetes mellitus, endocrine disorders, digestive diseases, genitourinary diseases, skin diseases, musculoskeletal diseases, congenital anomalies, oral conditions.		

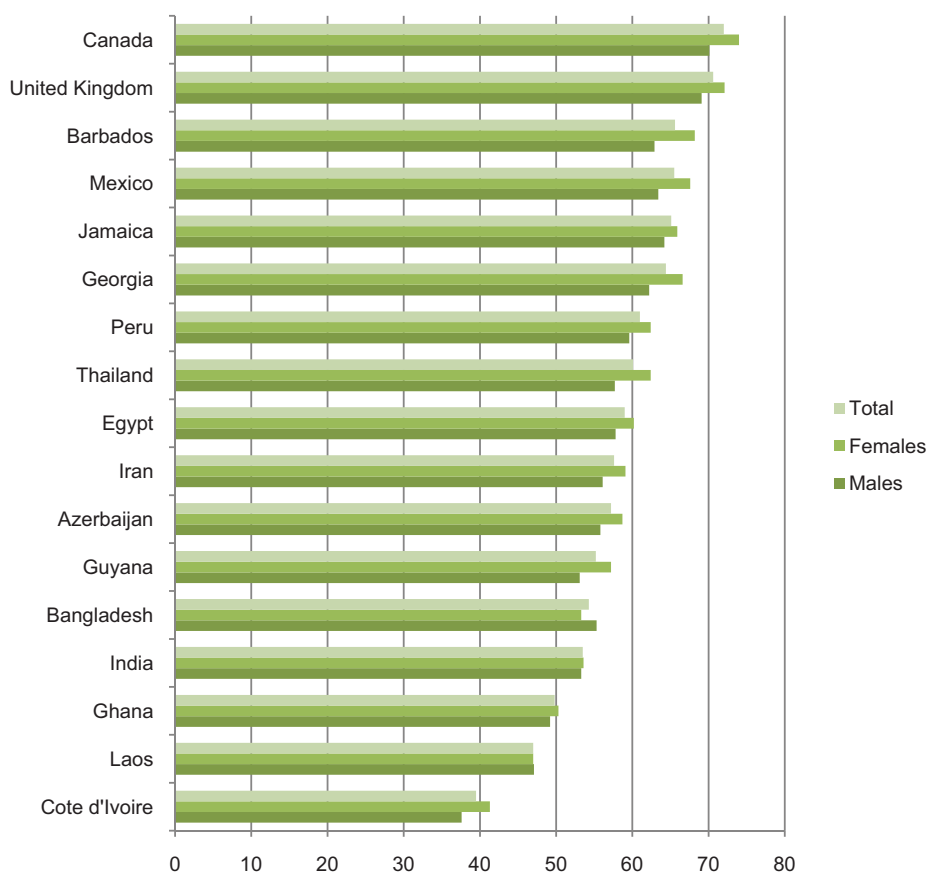
Overall, the health of Jamaicans as measured by Healthy Life Expectancy (HALE)⁴ is below that of developed countries. Jamaica's HALE places it below developed countries such as Canada and the United Kingdom, as well as its regional neighbors Barbados and Mexico. Nevertheless, it scores above various countries from different regions, including some countries from the Caribbean (based on the WHO 2002 HALE data for all member states). As with all other countries, HALE data for Jamaica reveal consistently higher data for females (65.9) than males (64.2). According to the 2007–8 Jamaica Health and Lifestyle Survey data, NCDs such as hypertension, diabetes, and high cholesterol are more frequently reported for women than men at disease prevalence rates of 29.3:10.7 for hypertension, 9.1:6.1 for diabetes, and 4.9:2.6 for high cholesterol for women and men respectively (Wilks, et al. 2008). At particular risk are women with low incomes, many of whom are uninsured or underinsured and cannot afford preventive screenings for high blood pressure, high blood cholesterol, and diabetes, which would help with early detection of cardiovascular and other NCDs (Figure 3).

TABLE 5. TOP 10 CAUSES OF DALYS, JAMAICA, 2004

CAUSES	%
Neuropsychiatric conditions	21.3
Infectious and parasitic diseases	12.3
Cardiovascular diseases	10.7
Intentional injuries	8.4
Malignant neoplasms	6.4
Respiratory diseases	5.8
Sense organ diseases	5.3
Unintentional injuries	5.0
Perinatal conditions (h)	4.9
Musculoskeletal diseases	2.9
Source: World Health Organization (WHO), 2004	

⁴ HALE combines mortality (life expectancy) and morbidity (disability) measures and is most easily understood as a lifespan in full health, without disability

FIGURE 3. LIFE EXPECTANCY AT BIRTH IN JAMAICA COMPARED TO SAMPLE COUNTRIES FROM DIFFERENT REGIONS, 2002



Source: (World Health Organization 2003)

The demographic and epidemiological transitions described in this chapter have an impact on the NCD burden on Jamaica; this will be considered in the next chapter.

3. THE BURDEN OF NCDs IN JAMAICA

This chapter takes an in-depth look at the trends and current burden of disease in Jamaica caused by NCDs. An analysis of time trends over the past decade is presented to determine whether disparity in chronic disease trends exists among individual socioeconomic and demographic sub-groups. A detailed analysis of the current situation disaggregated by socioeconomic variables (gender, age, education, region of residence, economic status) was also undertaken to provide a more comprehensive picture of NCDs. The primary sources of data for the analysis are the 1990–2009 JSLC, complemented by data from the Ministry of Health, WHO, and peer-reviewed journals.

Key Findings

1. NCDs have increased steadily across the entire Jamaican population over the last twenty years but much more in the last decade.
2. Estimated NCD prevalence rates increased across all five expenditure quintiles from approximately 4 percent in 1994 to 15 percent in 2007.
3. Hypertension is the most frequently reported NCD in nearly all population quintiles, followed by diabetes and asthma.
4. Gender disparity in NCDs persists and the gap between women and men is widening over time, with women at higher risk.
5. The prevalence of NCDs among women has increased much faster than among men; women have shown higher prevalence in most NCDs, such as asthma, diabetes, hypertension, and arthritis.
6. NCDs are rising substantially and rapidly as the population ages.

Analytical Approach

A time-trend analysis on the prevalence of NCDs among adults in Jamaica was carried out. Historical chronic disease data are derived from the JSLC 1994–2007. The sample for this analysis was restricted to adults aged 18 years and older because adults are the population group most at risk for NCDs worldwide. Individual adult NCD status is self-reported by respondents in a four-week reference period⁵. The time-trend analysis method used here is also adopted throughout this report (see the Annex on Time-Trend Analysis for details). A regression model was used to estimate the impact of time changes on the pattern of NCDs, controlling for other factors such as age, gender, region of residence, and expenditure quintile. The primary goal was to capture other factors which affect NCDs, which could not be controlled, such as overall socioeconomic development and environmental changes over time.

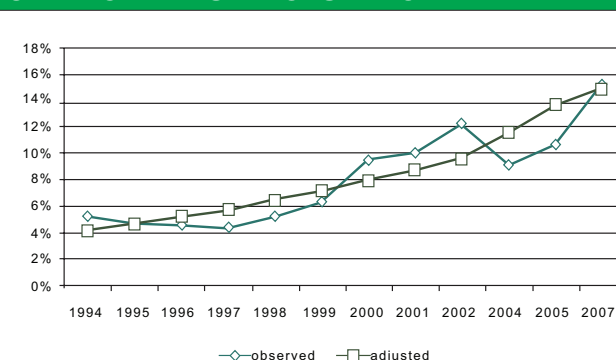
Data from the 2008 JSLC were used to analyze the current NCD situation in Jamaica. The 2008 JSLC was the first survey that collected information from all respondents on the current status of major NCDs. Compared with the previous surveys, the 2008 survey is more comprehensive because: (i) its sample size is the largest among most recent surveys (about 22,294 individuals and 6,513 households); (ii) the NCD questions were asked of each respondent regardless of his/her last four-week illness status; and (iii) specific types of diseases were identified.

Overall Increase of NCDs among the Total Population

NCDs increased progressively among the entire Jamaican population in the last decade and the prevalence rates vary significantly by socioeconomic group. Hypertension, diabetes and asthma are currently the most prevalent NCDs in Jamaica. Patterns of specific diseases vary considerably by socioeconomic groups and gender as well, with women, seniors, rural residents, and the richest group reporting higher prevalence rates of NCDs. The results from the analysis provide policy makers with a basis for better targeted interventions to address inequalities.

The prevalence of NCDs increased dramatically in the last decade in Jamaica. Figure 4 shows a clearly upward trend of both observed and adjusted NCD prevalence among Jamaican adults (age 18 years and older) during the last decade. After controlling for major individual socioeconomic characteristics including individual age, gender, region of residence, and population expenditure quintile, the adjusted percentage of people were suffering from at least one type of NCD disease was, based on this time-trend analysis, found to have gone up from 4.16 percent to 14.88 percent in 15 years between 1994 and 2007, and NCDs are predicted to account for 25.85 percent of the population in 2015 if this time trend continues and the population composition continues as in 2007.

FIGURE 4. OBSERVED AND ADJUSTED TIME TREND OF NCD PREVALENCE AMONG JAMAICAN ADULT POPULATION



* Individual basic socioeconomic and demographic characteristics were controlled for adjusted prevalence
Source: Study estimates based on Jamaica Surveys of Living Conditions 1994–2007

There was a significant increase in estimated NCD prevalence rates among all five expenditure⁶ quintiles from approximately 4 percent in 1994 to 15 percent in 2007. The parallel increase of NCD prevalence rates among the five expenditure quintiles indicates that NCDs affected every socioeconomic group. The gap between the poorest and richest quintiles was constant, ranging from a prevalence rate of 1.37 to 2.11 percent over the last 15 years. The prevalence of asthma and arthritis is more or less the same in all population quintiles. Hypertension is the most frequently reported NCD in nearly all socioeconomic groups but is more prominent among the richer population, while mental illness is more of an issue among the poorer groups. Diabetes and asthma follow hypertension as the most frequently reported NCDs among nearly all socioeconomic groups. The percentage of the population that reported NCDs by disease type and socioeconomic group is provided in Table 6. Roughly 10 percent of the population indicates that they currently have hypertension, 4.8 percent have diabetes, and 4.34 percent have asthma.

⁵ It should be noted that the definitions of NCD before and after JSLC 1999 are somewhat inconsistent. We acknowledge such difference and introduce a time variable to minimize the incomparability issue in these two periods.

⁶ Expenditure data are used as a proxy for income.

TABLE 6. PERCENTAGE (%) OF THE POPULATION REPORTING NCDs BY DISEASE TYPE AND SOCIOECONOMIC SUBGROUPS

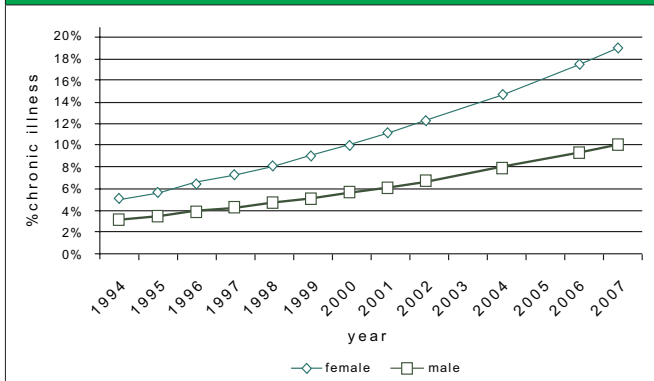
	ASTHMA	DIABETES	HYPER-TENSION	ARTHRITIS	MENTAL ILLNESS
All	4.34	4.80	9.97	4.20	0.69
Gender					
Male	4.28	3.21	5.99	2.63	0.78
Female	4.40	6.33	13.78	5.71	0.60
Age					
0–17	6.50	0.17	0.06	0.00	0.06
18–29	3.83	0.60	1.18	0.16	0.63
30–59	2.64	5.66	12.97	2.78	1.21
60+	3.33	21.70	42.75	25.61	1.18
Region					
KMA*	6.24	4.81	9.51	3.63	0.52
Rural	3.40	4.34	9.97	4.69	0.85
Urban	4.58	5.65	10.32	3.76	0.52
Pop quintile					
Poorest	4.09	3.20	8.11	3.87	1.11
2nd quintile	4.33	3.89	7.88	3.69	0.77
3rd quintile	4.42	4.30	9.98	4.23	0.68
4th quintile	4.15	6.09	11.09	4.54	0.58
Richest	4.71	6.48	12.71	4.68	0.31

Source: Study estimates based on Jamaica Survey of Living Conditions 2008.

Current data reveal minor differences in NCD prevalence among urban and rural areas. People in the Kingston Metropolitan Area (KMA) reported slightly more asthma cases (6.24 percent) than rural and urban residents, while diabetes, hypertension, arthritis, and mental illness are at about the same level in all regions.

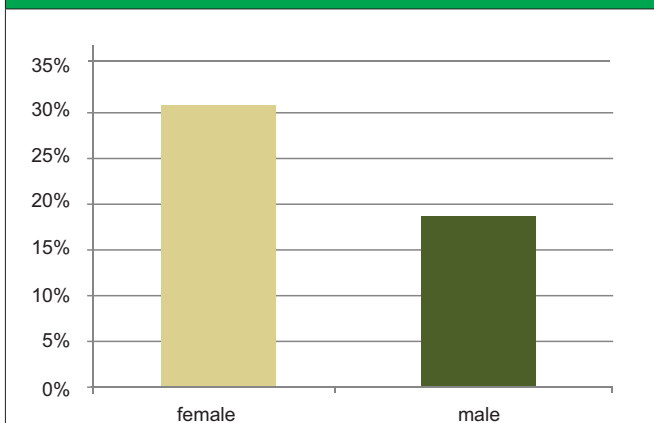
The Gender Disparity in the Burden of NCDs

The rapidly increasing trends among subgroups exhibit important disparities in Jamaica, especially between men and women. The prevalence of NCDs among women has increased much faster than among men. In 1994, the difference in prevalence rates between women and men, adjusted by basic individual demographic and socioeconomic characteristics, was only a 1.96 percentage point, whereas the difference surged to 8.92 percentage points after 15 years. Further examination of the NCD trends reveals substantial regional disparities. Unlike some countries where males are at a disadvantage in terms of NCD prevalence, women in Jamaica were on average at a significantly higher risk and this gap has diverging continuously during the last decade (Figure 5).

FIGURE 5. ADJUSTED TIME TREND OF NCD PREVALENCE BY GENDER AMONG JAMAICA ADULT POPULATION

*These time trends of NCD prevalence rates among adult population were adjusted by individual socioeconomic and demographic characteristics.
Source: Study estimates based on Jamaica Surveys of Living Conditions 1994–2007

Gender disparity in NCDs persists and confirms the disparity observed in the trend analysis. This disparity was confirmed by a cross-sectional data analysis of the 2008 JSLC Survey. NCDs were found to be more frequently reported for women than for men at prevalence rates of 20.44 percent for adult men and 33.25 percent for adult women according to the 2008 JSLC Survey as shown in Figure 6. The information from the Jamaica Health and Lifestyle Survey indicated that women with low income were at higher risk of developing NCDs (Wilks, et al. 2008). Females reported higher prevalence in most NCDs such as asthma, diabetes, hypertension, and arthritis. The gender gap is largest for hypertension (7.79 percent), and minimal for asthma and mental illness (less than 0.2 percent).

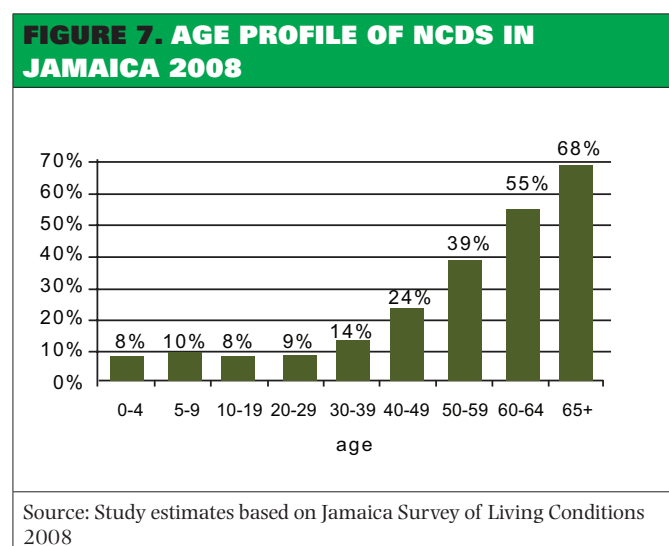
FIGURE 6. ADJUSTED NCD PREVALENCE RATES BY GENDER OVER TIME

Source: Study estimates based on Jamaica Survey of Living Conditions 2008

The Age Disparity in the Burden of NCDs

As expected, age is a major factor contributing to NCDs even after controlling for other demographic and socioeconomic changes. As Figure 7 illustrates, a larger share of the senior population (age 60+) reported NCDs compared to younger adults, and the general difference across age bands became larger over time. The prevalence of NCDs in seniors in the early 1990s was around 13.19 percent and it nearly tripled (40 percent) after only 15 years. The increase of NCD prevalence among adults of 30–50 years old and those of 18–29 years old is only 3.78 percent and 8.56 percent respectively. As the population in Jamaica ages, the trend in NCD prevalence is likely to continue increasing. The elderly population, representing 11 percent of Jamaica's total population, is indicated by the projections in Figure 7 and is a growing segment of the population. Aging will contribute to the increasing burden of disease from NCDs and places greater demand and economic pressure on households, the health sector, and the economy at large.

Profiles by age group consistently suggest that prevalence of most NCDs is rising rapidly as people are aging. For example, 0.17 percent of children and adolescents aged 0–17 reported that they were suffering from diabetes, but this number increased to 21.70 percent in the elderly (60+) group. A similar pattern is found for hypertension, arthritis, and mental illness. The only exception is asthma, which is more prominent in the 0–17 age group (6.50 percent) and least reported in the adult (30–59) and elderly (60+) groups. The age profile of NCDs in 2008 shows that NCDs were present in 8.21 percent of children aged 0–4 years ; 24.05 percent in adults between 40 and 49 years, and 68.46 percent in persons 65 years and over (Figure 7).



This chapter has considered the burden of NCDs on Jamaica. The following chapter will consider the risk factors which lead to this burden.

4. RISK FACTORS CONTRIBUTING TO THE BURDEN OF DISEASE

This chapter discusses and analyzes the five major risk factors that increase the prevalence of NCDs in Jamaica. The trends over time and current profile of NCDs are influenced by multiple determinants and interactions among them. Obesity, unhealthy diet, physical inactivity, smoking, and alcohol consumption are globally acknowledged individual risk factors that play key roles in developing chronic diseases. A good understanding of these risk factors provides a robust foundation for policy makers to design targeted interventions for prevention.

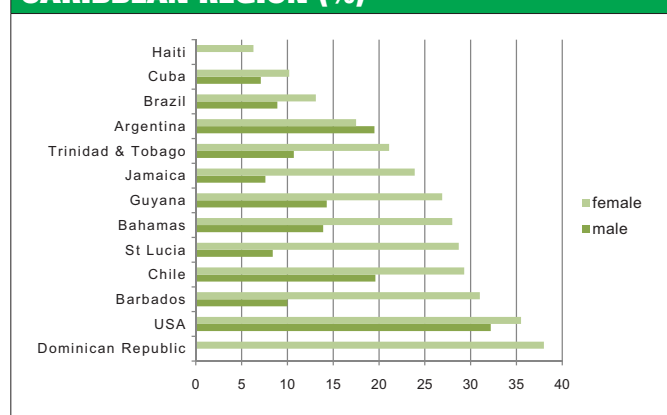
Key Findings

1. Obesity is the most prevalent chronic disorder in Jamaica.
 - Women are most affected but this is growing in the overall population and accounts for a major share of morbidity, disability, and healthcare costs.
 - Jamaican culture favors weight, which may contribute to increasing obesity rates and partially explains the lack of action to reduce weight and obesity.
 - Globalization and growing urbanization have introduced a culture of eating out, coupled with a diet already consisting of a large proportion of staple foods and sweets.
2. A large percentage of the Jamaican population in all age groups, particularly women, are either inactive or have low levels of physical activity.
 - Levels of physical activity are lower among those with a lower educational level, older people, and the unemployed.
3. The level of tobacco smoking in Jamaica is not high compared to countries like China and Russia, but smokers form their addictive habit at very young ages in Jamaica.
 - Smoking is more prevalent among men and the poorer segments of the population but rich and poor households alike show a growing trend of tobacco consumption.
 - Expenditure on tobacco per household has risen 1.5 times between 2000 and 2008.
4. Men consume more alcohol than women and Jamaicans start to drink alcohol as early as the age of 12.

OBESITY

Obesity is the most prevalent chronic disorder in Jamaica. The number of obese people in Jamaica is alarmingly high, particularly among adult women. Using WHO criteria for Body Mass Index (BMI)⁷, only 7.6 percent male adults in Jamaica are obese (BMI ≥ 30 kg/m²) while 23.9 percent female adults fall in this category (Figure 8). Obesity is an increasing health threat globally; WHO estimated that in 2002 more than one billion adults worldwide were identified as overweight and at least 300 million were clinically obese (BMI ≥ 30 kg/m²).

FIGURE 8. OBESITY PREVALENCE IN THE CARIBBEAN REGION (%)



Source: International Obesity Taskforce, International Association for the Study of Obesity

The gender disparity for obesity remained through all age groups and it was more severe among middle-age groups. The JSLC indicated that more than 60 percent of Jamaicans aged 35 to 54 were either overweight (BMI between 25 to 29.9 kg/m²) or obese (BMI ≥ 30 kg/m²) in 2008, and the majority of them were women (Table 7). Almost half of women in the 35–54 age group are obese; adding overweight women in this group, more than 80 percent are above normal weight. Even among younger age groups (15–24), almost 40 percent of women were either overweight or obese compared with only 22 percent of men. While overweight and obese among men decreased over age, obesity among women seems to persist in older ages (Wilks, et al. 2008).

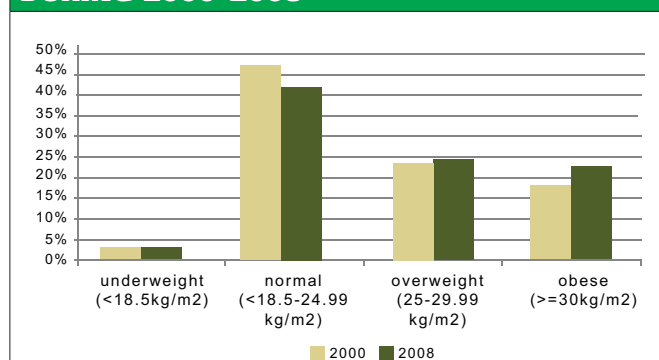
TABLE 7. PREVALENCE OF WEIGHT STATUS OF JAMAICANS BY AGE AND GENDER, 2008

NUTRITION STATUS	15–24	25–34	35–44	45–54	55–64	65–74
Underweight (<18.5kg/m ²)						
Male	8.4	3.4	2.1	2.0	4.8	9.3
Female	12.6	2.4	2.4	1.4	1.3	2.6
Total	10.5	2.9	2.3	1.7	3.1	5.8
Normal(18.5–24.99kg/m ²)						
Male	70.0	65.8	47.0	43.6	47.7	49.6
Female	49.5	35.5	19.3	17.2	17.5	22.9
Total	59.7	49.9	32.6	30.6	32.8	35.7
Overweight(25–29.99kg/m ²)						
Male	12.6	21.5	36.7	32.9	35.4	29.1
Female	21.5	24.5	27.8	33.9	33.1	33.3
Total	17.0	23.1	32.1	33.4	34.3	31.3
Obese (>=30kg/m ²)						
Male	9.0	9.4	14.2	21.6	12.1	12.1
Female	16.5	37.7	50.5	47.6	48.0	41.2
Total	12.8	24.2	33.0	34.4	29.8	27.3

Source: JHLSII 2008 Report (Wilks, et al. 2008)

Data from the Jamaica Health and Lifestyle Survey reaffirm the conclusions drawn from the JSLC that prevalence of obesity is not only increasing among women, but also in the overall population. Compared with the Jamaica Health and Lifestyle Survey for 2000, it is clear that the number of people of normal weight decreased and the obese population increased by 5 percent (Figure 9).

FIGURE 9. CHANGES (%) IN NUTRITIONAL STATUS OF JAMAICANS 15-74 YEARS DURING 2000-2008



Source: JHLSII 2007-8 Report (Wilks, et al. 2008)

⁷ BMI is defined as weight in kilograms divided by square of the height in meters (kg/m²).

International comparative analysis reveals that the obesity risk in Jamaica is on the high end of the global scale. A study done by Durazo-Arvizu (Durazo-Arvizu 2008) analyzed obesity prevalence in the United States, Nigeria, and Jamaica and showed that the unadjusted weight gain per year in Jamaica was four times higher than that of Americans and Nigerians. The average BMI of the 40–44 year old Jamaican is 27.7, which makes it 2.7 units higher than the globally recognized overweight level of BMI 25. Projecting five years forward, Jamaicans will on average increase by 2.5 BMI units, compared to 0.925 units in the US. A study by Luke (Luke 2007) indicates a big gender difference in weight characteristics for the urban adult Jamaicans sample. Mean BMIs for females (BMI 29) were greater than males (BMI 27), and females gained on average more weight (7.4 kg during a six year follow-up) than males (6.1 kg) (Table 8).

TABLE 8. WEIGHT CHARACTERISTICS OF URBAN ADULT JAMAICANS

	MEN	WOMEN	TOTAL
Age (y)	38.2	37.7	37.9
Weight (kg)	83.1	76	79.4
BMI (kg/m ²)	27	29	28
Body fat (%)	24.5	38.5	31.7
Weight change (kg)	6.1	7.4	6.8
Weight change per year (kg/y)	1.1	1.2	1.1
Source: (Luke 2007)			

Obesity poses a serious threat to the nation's health and economy. Unless effective prevention and control measures are taken, the society will bear high direct (treatment) and indirect (loss of productivity) costs. Obesity is one of the leading causes of diabetes mellitus and cardiovascular diseases in the country and contributes to the major share of morbidity, disability, and healthcare costs (Durazo-Arvizu 2008).

Jamaican culture favors weight, which may contribute to the increase in obesity. Adult weight is often culturally associated with prosperity and is thus a desirable feature in partners and spouses⁸. Moreover, parents in Jamaica believe that chubby babies are healthier and tend to overfeed their children, unaware of the real health impact of doing so. This conception could be an important factor contributing to increased obesity among children – 11 percent of teenagers in the 10–15 age group and 35 percent in the 15–18 age group are overweight or obese (FAO 2002). Clinical and population studies in Jamaica found that obesity was significantly associated with individuals' socio-demographic characteristics such as age, gender, race, education, and economic status, and interacted with individual behavior as to physical activity and diet. Studies found that 19.2 percent of obese women versus 25.7 percent of obese men, and 42.2 percent of overweight women

versus 60.6 percent of overweight men, perceived their weight to be acceptable (Durazo-Arvizu 2008, Ichinohe 2005).

UNHEALTHY DIET

Unhealthy diet is one of the main risk factors for high blood pressure, raised blood glucose, abnormal blood lipids, and overweight or obesity, and is associated with the major NCDs such as cardiovascular disease, cancer, and diabetes. Over the past 20 years, Jamaicans' food consumption patterns have changed due to easy access to fast food as a consequence of liberalization of the economy and removal of international trade barriers. Transnational food companies have increased the supply of unhealthy food and beverages to the local market. By contrast, there are few incentives for fruit and vegetable production, with alarming prevalence of unhealthy diets. The 2007–8 Jamaica Health and Lifestyle Survey shows that 98 percent of 10–15 year old Jamaicans regularly consume sugar-saturated soft drinks, and over 80 percent of the 15–74 age group consume fast food more than twice a week.

Globalization and urbanization in Jamaica have introduced a culture of “eating out” and increased consumption of street foods. Chains of fast food outlets are rapidly expanding and Jamaica has the largest network of fast-food restaurants in the region for the first time, further raising the population's cholesterol; powerful marketing strategies influence the youth particularly (Tackling the Obesity Epidemic, the Impact of Food Trade and Commerce 2009).

The Jamaican diet consists of a large proportion of staple food and sweets with only a small number of the population consuming fruits. In the 2007–8 Jamaica Health and Lifestyle Survey (Table 9), more than 60 percent of individuals reported that they consumed 6–12 servings (3–6 times a day) of staples per day, with rural males and females consuming the largest quantity of staples and legumes. Fast-food consumption was higher among urban residents (more than 2 times a week) (14.1 percent for urban residents versus 7.4 percent for rural residents), but more than 80 percent of individuals reported consuming fast food less than once per week or not at all. A higher proportion of rural males than urban males (13.2 percent versus 9 percent) and urban women compared to rural women (15.2 percent versus 13.1 percent) consumed pastry one or more times per day. Three-quarters or more of Jamaicans aged 15–74 consumed one or more bottles or glasses of sweetened beverages per day, with more rural than urban dwellers consuming these amounts. Among all age groups, a high percentage of 15–19 year olds prefer fast food (66 percent), pastries (85 percent), and sugar beverages (96.9 percent) and only small numbers consume fruits (9.7 percent).

⁸ Jamaican men favoring full-figured women was listed as one of the factor contributing to obesity during the Bank team's consultation on the report in November 2010.

TABLE 9. DISTRIBUTION (%) OF FOOD CONSUMPTION BY SEX AND PLACE OF RESIDENCE, 2008

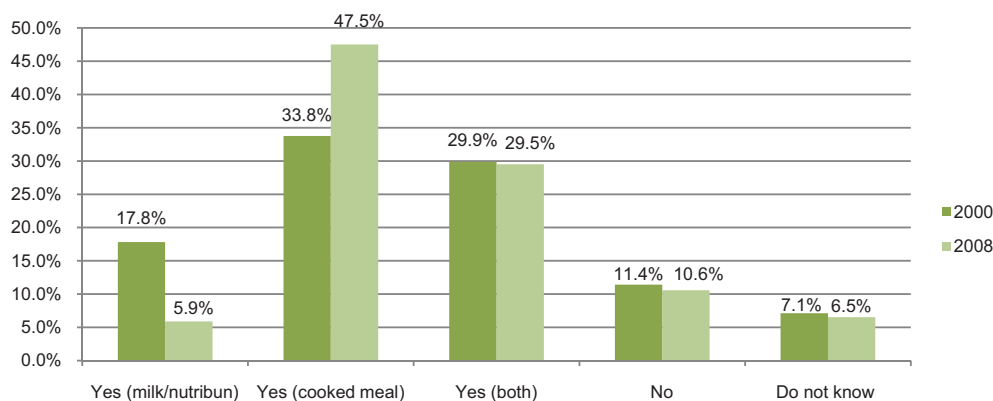
DIETARY PATTERNS	MALE			FEMALE			TOTAL		
	U	R	T	U	R	T	U	R	T
*Staples									
<3 times per day	33.7	26.5	31.1	39.0	28.3	35.2	36.4	27.4	33.2
3-6 times per day	64.3	69.5	66.1	58.7	70.0	62.7	61.5	69.8	64.4
>6 times per day	2.1	4.0	2.7	2.3	1.7	2.1	2.2	2.8	2.4
Legumes									
<2 times per week	60.7	51.6	57.5	56.7	48.8	53.9	58.7	50.2	56.7
2-3 times per week	37.4	46.7	40.7	41.5	49.5	44.3	39.5	48.1	42.6
>3 times per week	1.9	1.7	1.8	1.8	1.8	1.8	1.8	1.7	1.8
Fast-food Consumption									
None	54.4	73.1	61.0	58.5	65.4	61.0	56.4	69.2	61.0
<once per week	31.1	19.3	26.9	27.9	27.4	27.7	29.5	23.5	27.3
2-3 times per week	10.3	6.3	8.9	10.9	4.7	8.7	10.6	5.5	8.8
>4 times per week	4.3	1.2	3.2	2.8	2.5	2.7	3.5	1.9	2.9
Pastry consumption									
<1 times per day	91.0	86.8	89.5	84.8	86.9	85.6	87.9	86.8	87.5
1-3 times per day	9.0	13.2	10.5	14.7	12.9	14.0	11.9	13.1	12.3
>3 times per day	0	0	0	0.5	0.2	0.4	0.2	0.1	0.2
Sweetened beverage consumption									
<1 bottle/glass per day	23.7	18.0	21.7	25.9	18.8	23.4	24.8	18.4	22.5
1 bottle/glass per day	26.9	22.8	25.5	20.6	20.3	20.5	23.7	21.5	22.9
>1 bottle/glass per day	49.4	59.2	52.9	53.5	60.9	56.2	51.5	60.1	54.5
*One time per day is equated to a minimum of 2 servings of staples using 24 hr recall data									
Source: JHLSII 2007-8 Report (Wilks, et al. 2008)									

Dietary intake of high levels of salt is thought to contribute to the progression of a number of chronic diseases⁹. Salt consumption is linked to an increased incidence of cardiovascular disease and death among overweight people. Low-salt diets seem to be especially important for people with hypertension. In Jamaica, however, only 1.2 percent of men and 2.6 percent of women consume low portions of salt in their meals. Among adult patients with chronic disease, only 5.7 percent with hypertension reported low salt intake, and among patients with obesity, diabetes, and high cholesterol only 4.0 percent, 5.8 percent and 4.8 percent reported low salt intake respectively (Wilks, et al. 2008).

People do not see a need for dietary management in Jamaica. Ninety-seven percent of the obese people are not on diet and less than 5 percent of Jamaicans reported themselves as ever having being on a special diet to reduce health complications. Ninety-four percent of hypertensive people do not follow a low salt diet and 95 percent of patients with hypercholesterolemia are not on a low fat/cholesterol diet. Only 16 percent of diabetic patients were reported as being on a diabetic diet (Wilks, et al. 2008).

A small improvement was observed over an eight-year period (2000–08) thanks to government efforts to promote healthy nutrition and social wellbeing through school nutrition programs. There was a 14-percent increase in the share number of cooked meals eaten whose nutritional value and preparation guidelines were developed by the Caribbean Food and Nutrition Institute, which ensured well-balanced and healthy menu composition. As a part of the school feeding program, children are taught nutrition education that promotes healthy eating habits (Figure 10).

⁹ The recommendation for sodium in the Dietary Guidelines for Americans from the U.S. Department of Health and Human Services is 2,400 milligrams (mg) daily for adults. This is about the amount in 1 teaspoon of salt (2,300 mg, to be exact).

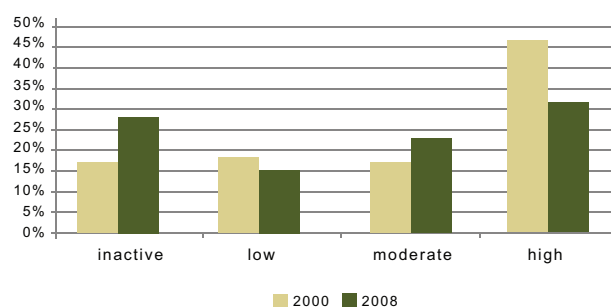
FIGURE 10. DISTRIBUTION OF SCHOOL FEEDING PROGRAM IN JAMAICA (% SCHOOL REPORTING PROGRAM ENROLLMENT)

Source: Study estimates based on JSLC 2000 and 2008

PHYSICAL INACTIVITY

In addition to dietary factors, low levels of physical activity are another strong predictor of obesity. While the transition to more affluent and modern lifestyles relieves people of physical work (with easy access to transportation, the replacement of manual labor with machinery, and mostly sedentary jobs), this reduces energy needs and potentially leads to people being overweight, obese, and having diabetes, cancer, and cardiovascular concerns. Promoting regular physical activity and creating an environment that supports physical activity can reduce the epidemic of obesity (Fogelholm and Kukkonen-Harjula 2000) and risk of heart attack, colon cancer, diabetes, and high blood pressure, and may reduce the risk of stroke. It also contributes to healthy bones, muscles, and joints; reduces falls among older adults; helps to relieve the pain of arthritis; reduces symptoms of anxiety and depression; and is associated with fewer hospitalizations, physician visits, and medications.

A large percentage of the Jamaican population reports either being inactive or having low levels of activity¹⁰. According to the Jamaica Health and Lifestyle Surveys of 2000 and 2007–8 (Figure 11) the proportion of the Jamaican population in the 15–74 year age group who reported being inactive doubled in the interval (30 percent versus 17 percent), and the proportion of people being highly active has dramatically dropped from 47 percent in 2000 to 33 percent in 2008. The proportion of people who reported having low levels of activity did not change significantly but the proportion of moderately active people slightly increased.

FIGURE 11. CHANGES (%) IN PHYSICAL ACTIVITY LEVELS OF JAMAICANS 15-74 YEARS 2000-2008

Source: JHLSSII 2007-8 Report (Wilks, et al. 2008)

Females are far less physically active relative to males in all age groups. The age and gender profiles of levels of physical activity in 2008 are listed in Table 10. The proportion of females classified as physically inactive exceeds that of males in all age groups, and the proportion of males who are moderately or highly active is significantly larger than all ages of females. The variation across age groups within genders is not substantial. Females tend to be less active at younger (15–24) and older ages (65–74) but more active in the age group 25–64.

¹⁰ Physical activity was examined by questionnaire in the Jamaica Health and Lifestyle Survey 2007-8, which included both occupation and recreation. A composite score on a four-point scale was derived (Wilks, et al. 2008).

TABLE 10. PHYSICAL ACTIVITY LEVELS (%) OF JAMAICANS BY AGE AND GENDER, 2008

	15-24	25-34	35-44	45-54	55-64	65-74
Low activity						
Male	12.0	12.1	16.0	11.2	5.0	16.1
Female	22.0	17.1	17.1	24.0	17.0	19.0
Moderate activity						
Male	28.0	22.4	22.4	20.1	31.0	23.1
Female	19.3	21.1	21.1	16.1	23.0	20.0
High activity						
Male	47.0	54.0	46.0	55.4	41.4	31.3
Female	12.0	21.0	22.0	24.4	30.0	8.0

Source: JHLSII 2008 Report (Wilks, et al. 2008)

There is a close correlation between levels of energy expended, as well as lack of weight management, and obesity in adult Jamaicans. Clinical multi-year surveys (Luke 2007) identified that energy expenditure¹¹ of Jamaican women is significantly lower than that of men. More than 44 percent of Jamaicans report being physically inactive with a high gender disparity: 48 percent of men are reported as physically active, whereas 43 percent of women do not engage in any physical activities whatsoever. The negative correlation between BMI/fat mass and physical activity level is relatively stronger for males.

TABLE 11. ACTIVITY ENERGY EXPENDITURE OF URBAN ADULT JAMAICANS

	MEN	WOM-EN	TOTAL
Total daily energy expenditure (MJ/d)	13.23	9.94	11.54
Resting expenditure (MJ/d)	6.56	5.5	6.02
Activity expenditure (MJ/d)	5.42	3.32	4.34
Activity expenditure (kJ/kg.d)	66.3	46.4	56.1
Physical activity level (times/week)	2.03	1.76	1.89

Source: (Luke 2007)

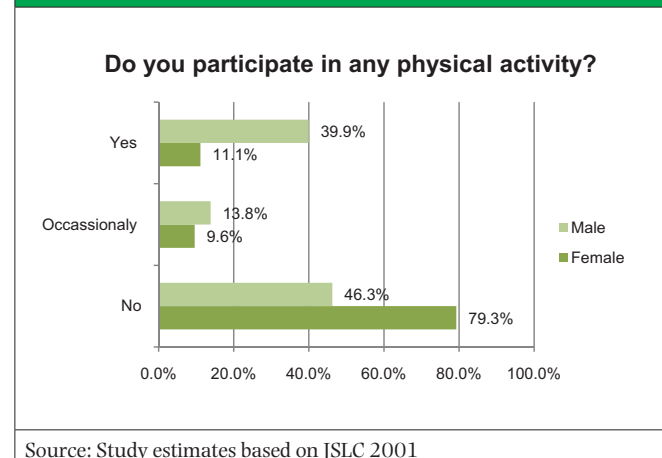
A relatively higher energy expenditure of men is due to the more physical work performed and more miles walked regularly (37 percent of men versus 8.5 percent of women). A total of 41

¹¹ Energy expenditure refers to the amount of energy (calories) that a person uses to breathe, circulate blood, digest food, and be physically active. To prevent weight gain, energy intake must be balanced with energy expenditure. Total daily energy expenditure in this study was measured using the doubly labeled water method, resting energy expenditure using indirect calorimetry and activity expenditure calculated as the difference between daily energy expenditure and resting energy expenditure. Refer to (Luke 2007) for details.

percent of Jamaican women are unemployed, stay primarily at home and expend minimal energy. An average of 90 percent of the 15–74 age group report leading mostly sedentary lifestyles with limited participation in physical activities. Less than 10 percent of the population made efforts to increase their activity levels, of which group the majority are men (Wilks, et al. 2008).

The educational level is positively associated with the level of physical activities (Wilks, et al. 2008). Adults with higher educational attainment are more likely to be physically active – about 39 percent of people with post-secondary education report high levels of exercise versus 34.1 percent of those with only primary or lower education and 30.85 percent of those with secondary education.

The habit of staying physically inactive develops at a young age in Jamaica, particularly among girls. The analysis of the 2001 JSLC, which collected information on physical activities of 17–29 year olds, found that 64 percent of youth did not participate in any activity (79.3 percent of women and 46.3 of men), 11.5 percent did occasionally (13.8 percent of men and 9.6 percent of women) and only 24 percent exercised on a regular basis or often (39.9 percent of men and 11.1 percent of women) (Figure 12).

FIGURE 12. FREQUENCY OF PHYSICAL ACTIVITY OF 17–29 AGE GROUP, 2001

Source: Study estimates based on JSLC 2001

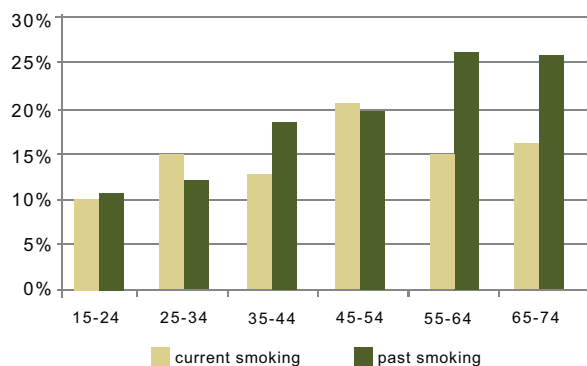
Levels of physical activity for adults (aged 15–74) are associated with work status. Employed males of higher economic status tend to be more physically active. The Jamaica Health and Lifestyle Survey 2007–8 also indicates that employed people (36.2 percent) are more likely to be in high or moderate physical-activity categories than unemployed people (31.4 percent). Approximately 40 percent of Jamaicans reported the nature of their work as being sedentary, and doing mainly non-strenuous walking, while a much higher proportion of males are involved in strenuous walking or heavy physical work than women (37 percent versus 8.5 percent). Meanwhile, unemployment among women is more than double that of men (41 versus 18 percent).

Jamaican culture influences the perception of body shape and fitness not to perceive overweight or obesity as unhealthy or unflattering. Data collected in the Jamaica Health and Lifestyle Survey 2007–8 shows that for adults and seniors (15–74) the majority of males (74 percent) report that they are either “very fit” or “fit” and 62 percent of females, even though a large proportion of them are overweight or obese. Only a small percentage of both males (5.3 percent) and females (9.4 percent) reported being “not fit” even though data from the same survey show a high percentage of women either over-weight or obese.

SMOKING

Tobacco smoking is a serious public health risk due to its association with cardiovascular diseases and chronic respiratory problems. Smoking prevalence is relatively high in all age groups in part because of Jamaica’s long tradition of tobacco production, it being one of five countries producing brand-name tobacco. The population has easy access to local tobacco. Data from the Jamaica Health and Lifestyle Survey 2007–8 show that current use of tobacco is highest among the 45–54 age group (20.7 percent), followed by the 25–34 age group (15.2 percent) and the 55–64 age group (15.2 percent). About 10 percent of teenagers and young adults in the 15–24 age group smoke. Fourteen percent of participants of the survey reported smoking more than 20 cigarettes per day (males 12.2 percent and females 18.2 percent) while 75 percent smoke 1–5 cigarettes a day (Wilks, et al. 2008).

FIGURE 13. SMOKING BEHAVIOR BY AGE GROUP, 2008

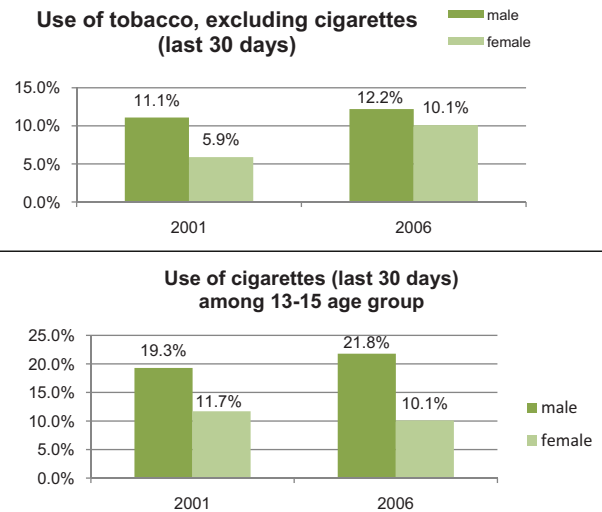


Source: JHLSII 2008 Report (Wilks, et al. 2008)

The survey data also indicate that smokers form their addictive habit at a very young age. Of current smokers, 37 percent report starting smoking at 15 years of age or younger. Even though data from this survey did not show the increase of prevalence of teenage smoking, the WHO analysis of tobacco use among teenagers in 2001 and 2006 identified a relatively higher increase of smoking among women (4.2 percent) than among men (1.1 percent) among 13–15 year olds. Modern marketing strategies used by tobacco companies and the diversification of their products through, for example, the distribution of small gifts with logos, flashy street

boards, T-shirts, or manipulation with menthol, fruit and other flavors, are having their intended impact on teenagers. Adolescent perceptions of the health risks posed by tobacco show lack of information and understanding of harm of smoking. This group is misled by positive images of smokers in youth social networks.

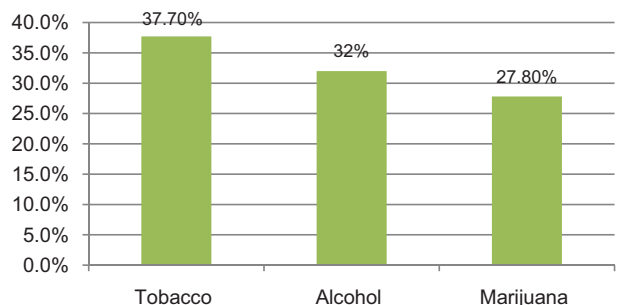
FIGURE 14. TOBACCO USE AMONG 13–15 AGE GROUP, 2001 AND 2006



Source: WHO, Jamaica: Global Youth Tobacco Survey 2006 (World Health Organization n.d.)

The high prevalence of teenage smokers in Jamaica is associated with serious social threats; smokers are relatively more inclined towards behavior such as unsafe sex, alcohol, and illicit drug abuse. According to the Jamaican National Council on Drug Abuse, tobacco is identified as the major first-time harmful substance used by the population and accounts for 37.7 percent of cases (Figure 15).

FIGURE 15. PERCENTAGE OF FIRST-TIME USERS IN JAMAICA



Source: (Jamaica National Council on Drug Abuse 2004)

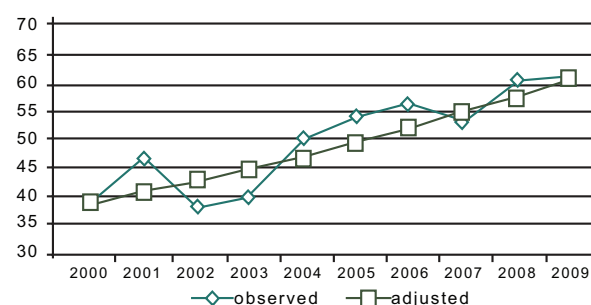
The Ministry of Health of Jamaica is committed to controlling tobacco use in the country. Efforts started in the mid-1990s, when preventive strategies were integrated into healthy lifestyle and chronic-disease-prevention programs. Since the early 2000s, more comprehensive anti-tobacco policies have been in effect: tobacco advertising was prohibited in the mass media and smoking was banned in all health institutions and some private companies (The Gleaner 2009). Currently, legislation is under parliamentary review for a total ban on advertising, promoting, and sponsorship of all forms of tobacco (Caribbean360 2011).

The first formal legislation of the tobacco industry was proposed to Cabinet on November 19, 2001, and approved on November 26 of the same year. The legislation set retail price adjustments, taxation policies, health messages, registration of imports, licensing businesses, contributions to the NHF, etc. On September 24, 2003, Jamaica formally signed the Framework Convention on Tobacco Control spearheaded by the WHO, and the excise tax on cigarettes was increased by 23 percent. On April 18, 2005, there was a further increase of tobacco product taxation that brought the excise tax up to 49.3 percent.

Per-capita expenditure on tobacco collected in JSLC panel surveys was used as a proxy for analyzing the changing trend of tobacco consumption over time. In the survey, tobacco goods include cigars, cigarettes, chewing tobacco, pipes, etc. Similar to other time trend analyses (details are in the Time-Trend Analysis Annex), a regression model is used to control for household characteristics and to capture pure time effect. Figures 16 and 17 illustrate a time trend of tobacco expenditure net of other household demographic and socioeconomic changes. Expenditure data were adjusted to constant 2008 Jamaican dollars. This analysis does not intend to capture the policy impact of tobacco control during this period. A more rigorous study of the relationship between income and tobacco, inflation, and other price effects is needed to analyze the real impact of excise tax regulations and the effectiveness of excise tax policies.

Household tobacco expenditure has shown a steady increase between 2000 and 2009. Figure 16 shows an overall increasing trend in household per-capita expenditure on tobacco goods after controlling for residential region and population quintiles. Between 2000 and 2009, the adjusted per-capita annual consumption of tobacco increased by roughly 21 percent. While excise tax increased in 2003 and 2005, and evidence found in this analysis suggests that household tobacco consumption declined in response to the price increases, there is insufficient evidence to conclude that increased tobacco tax did have the intended effect of reducing smoking.

FIGURE 16. OBSERVED AND ADJUSTED PER-CAPITA ANNUAL HOUSEHOLD TOBACCO EXPENDITURES (2008 JMD)

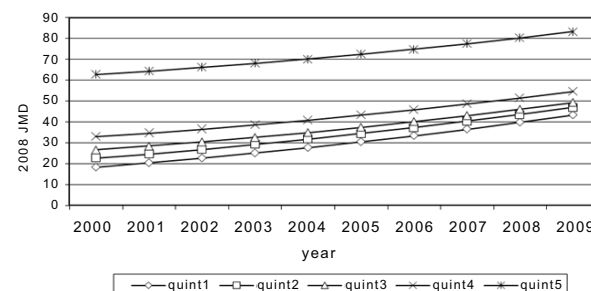


*adjusted for major household demographic and socioeconomic characteristics.

Source: Study estimates based on JLS 2000–2009

Rich households spent much more on tobacco but poor and rich households alike showed a growing trend of tobacco use from 2000 to 2009. All households experienced a parallel trend of increasing tobacco expenditure, with an increase of approximately 20 to 25 percent (adjusted) in all five household quintiles. Nevertheless, the richest ones (upper 5th quintile of households) spent more than double the amount on tobacco than the other four quintiles (Figure 17).

FIGURE 17. ADJUSTED PER CAPITA EXPENDITURE ON TOBACCO BY HOUSEHOLD ECONOMIC QUINTILES (2008 JMD)



*adjusted for household demographic and socioeconomic characteristics.

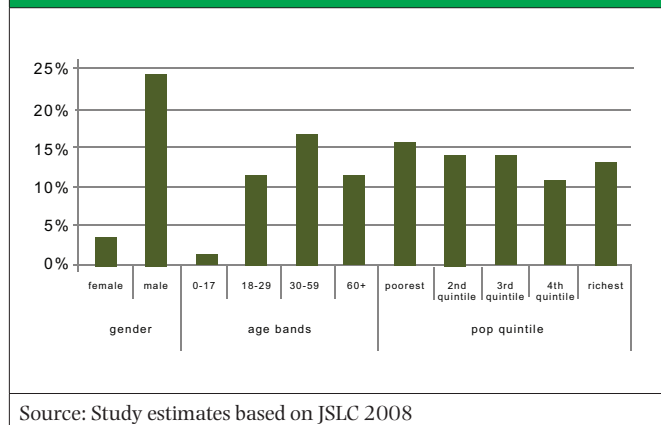
Source: Study estimates based on JLS 2000–2009

Smoking is more prevalent among men and the poorer segments of the population. A cross-sectional analysis of the most recent household data (JSLC 2008) was conducted to identify the socio-demographic characteristics of current tobacco users at the individual level. Unmarried males of 30–59 years from rural areas and with low income are more likely to smoke. The noteworthy finding is that smoking is becoming more prevalent among the poorest households. Patients with chronic illness and the beneficiaries of health insurance are less likely to smoke. Overall,

smoking is more prevalent in males, the 30–50-year age group, and poorer households.

Figure 18 illustrates the gender, age, and population quintile profile of individual smokers. Only 4.26 percent of females are current smokers compared with 25 percent of males. Unlike the information from Jamaica Health and Life Style Survey, the JSLC shows that smoking is most prevalent among 30–50 year old Jamaicans (18.51 percent), followed by young adults of 18–29 (12.91 percent), and seniors (12.70 percent). While household per-capita tobacco expenditure in the richest households is approximately four times that of the poorest (Figure 17), the proportion of current smokers in the poorest households is actually larger than that in the richest households (16.61 percent versus 13.78 percent).

FIGURE 18. PROFILE OF TOBACCO USERS IN JAMAICA

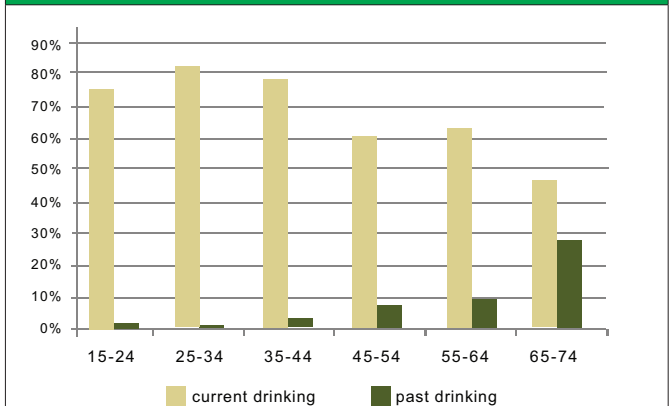


Source: Study estimates based on JSLC 2008

ALCOHOL USE

The current prevalence of alcohol consumption in Jamaica is alarming with males consuming more alcohol than females. Figure 19 presents the proportion of the population with their drinking behavior by age and gender. More than 75 percent of people aged 15–44 are current drinkers – the proportion reduces somewhat as people get older. Nevertheless, almost 50 percent of elderly people aged 65–74 drink. In terms of gender, 80 percent of males and 49.2 percent of females are current drinkers. Over 50 percent of males report daily or weekend drinking compared with only 18 percent of females. 14.8 percent of males have five or more drinks in a single day compared to 3.2 percent of females (Wilks, et al. 2008).

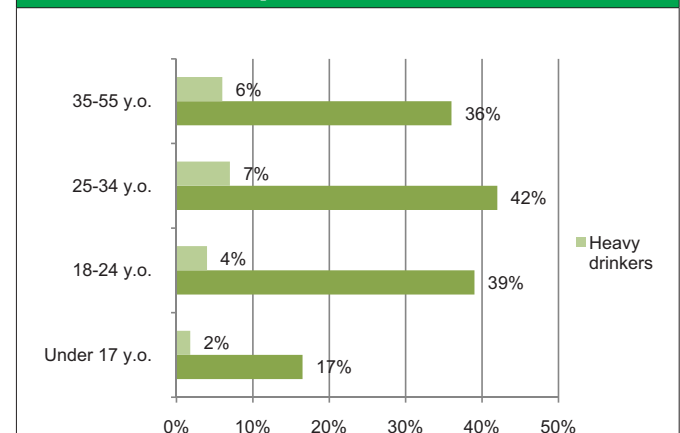
FIGURE 19. PERCENT OF JAMAICANS AGED 15-74 WITH DRINKING BEHAVIOR



Source: JHLS 2008 Report (Wilks, et al. 2008)

The national surveys indicate that Jamaicans start drinking alcohol as early as the age of 12. Despite the high level of awareness of the causes and consequences of alcohol and other substance abuse, regular alcohol drinking (more than twice a month) is reported by 20 percent of 12–17 year olds and 50.2 percent of 16–17 year olds. Two percent of adolescents younger than 17 are reported as being heavy drinkers (Figure 20).

FIGURE 20. PREVALENCE OF ALCOHOL USE BY AGE GROUPS, 2001



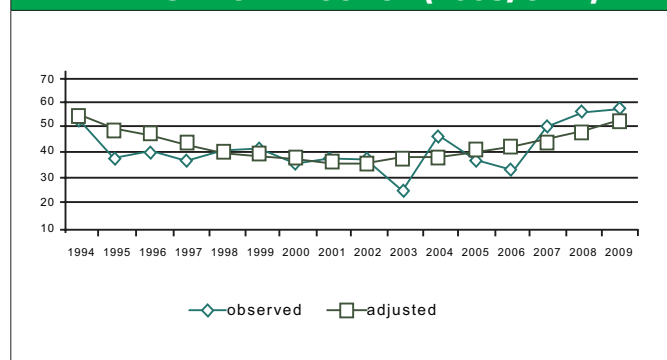
Source: : WHO, Jamaica country fact sheet: Youth drug use and abuse 2004 (World Health Organization 2004)

The current trends of alcohol consumption reflect the poor regulations and generally relaxed social attitudes, including those of youth, to it. The laws that do exist are not enforced for locals and are mostly observed in resort areas populated by foreigners. Liquor is easily available and sold in almost all grocery stores where teenagers can purchase it openly and are not checked for proof of age. Teenagers are allowed to purchase and consume alcohol as long as this is not done on store premises. Among adults, considerably

more men than women consume alcohol – 66.8 percent of males and 29.5 percent of females regularly consume (Ichinohe 2005).

The analysis of time trends reflects a slight drop in alcohol consumption in early 2000 but an increase in recent years. Household level per capita expenditure on alcohol during 1990–2009 shows a “U” shape (Figure 21), after controlling for residential region of household and population quintiles. A slight drop in alcohol expenditure was observed around early 2000. In recent years, however, alcohol expenditure has increased with the highest levels observed at 60 JMD/per capita per year. There is as yet no explanation for the decline around the early 2000s and subsequent increase. Alcohol excise tax increased in 2003, but current evidence is insufficient to indicate an impact. A more thorough investigation with detailed data collection at individual level is required.

FIGURE 21. OBSERVED AND ADJUSTED HOUSEHOLDS’ ANNUAL PER-CAPITA EXPENDITURE ON ALCOHOL (2008, JMD)

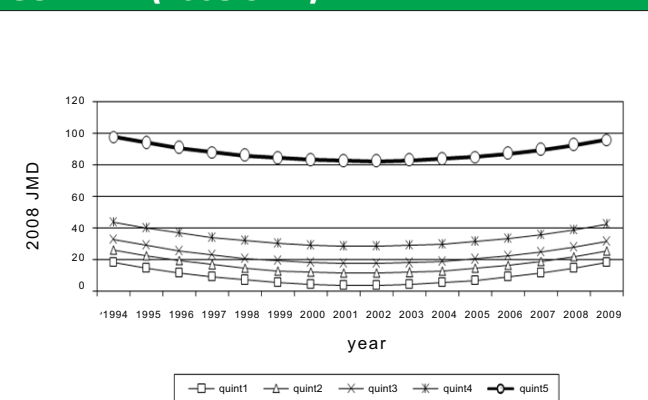


*adjusted for household demographic and socioeconomic characteristics.

Source: Study estimates based on JSLC 1994–2009

All quintiles experienced a slight drop in alcohol consumption in the 1990s, which picked up in the early 2000s. Further analysis of alcohol consumption by household quintiles in 1990–2009 provided trends consistent with tobacco-related expenditure: the wealthiest households spend most on alcohol and at an essentially higher per-capita amount relative to the lower four quintiles (Figure 22); all quintiles showed a more or less parallel trend that dropped slightly in the late 1990s but increased from the early 2000s. The poorest households spent very little during the early 2000s. There are limitations in using expenditure data to determine levels of alcohol consumption as the number of people drinking remains unknown and a lack of price and quantity data make it difficult to assess consumption trends. Since JSLC does not capture data on home-made alcohol, the reported expenditure on alcohol consumption is likely to be underestimated.

FIGURE 22. ADJUSTED ANNUAL PER-CAPITA EXPENDITURE ON ALCOHOL BY HOUSEHOLD QUINTILE (2008 JMD)



*adjusted for household demographic and socioeconomic characteristics.

Source: Study estimates based on JSLC 1994–2009

The risk factors examined in this chapter give a good understanding of the need for action to prevent the behavior that contributes to the burden of NCDs. The following chapter considers the response taken by the government of Jamaica to this burden.

5. JAMAICA'S RESPONSE TO NCDs

This chapter documents how the country has responded to the growing prevalence of NCDs. It provides an overview of the National Health Fund and some prevention programs in Jamaica, and describes the benefits of the program and the level of program awareness among the population.

Key Findings

1. Recognizing the importance of NCD prevention and control, the government of Jamaica created the National Health Fund (NHF) to reduce the costs of treatment for NCDs by providing free or subsidized medicines to patients with more than one NCD.
2. Residents aged 60 and over suffering from one or more of nine eligible diseases receive medication free of charge under the Jamaica Drug for the Elderly Program (JADEP) of the NHF.
3. All Jamaican residents with one or more of 15 eligible diseases receive subsidized medication through the NHF Card Program.
4. About 350,000 people, 13 percent of the population, are enrolled in the NHF.
5. More females than males in all age groups are aware of the two Programs.
6. NHF is financed by tobacco excise tax, special consumption tax (imposed on petrol, alcohol, and motor vehicles), and payroll tax on annual earnings paid by employees and employers.
7. The tobacco excise tax caused the major tobacco company to relocate to another Caribbean country.
8. The private sector dominates the pharmaceutical market and about 92 percent of all claims were filled by private pharmacies.
9. Those better off economically are more likely to utilize the Programs than the poor.
10. All socioeconomic groups benefited from the abolition of the user-fee but the major beneficiaries are the poorest population and children, adolescents, and seniors.

The government of Jamaica has recognized the importance of NCD prevention and control. The number-one national goal in the Vision 2030 Jamaica is “A Healthy and Stable Population”. National Strategies call for better performance by the healthcare system as well as a greater responsibility on the population for maintaining their own health. The National Policy for the Promotion of Healthy Lifestyles in Jamaica and the Healthy Lifestyles Program were developed in 2004. Their main objectives are to decrease the incidence of chronic diseases through changing high-risk behavior. The Healthy Lifestyles Program promotes physical activity, healthy diet, production and marketing of healthy foods, and the reduction of alcohol and tobacco use. The Program also addresses reproductive health, violence, and injury.

NATIONAL HEALTH FUND

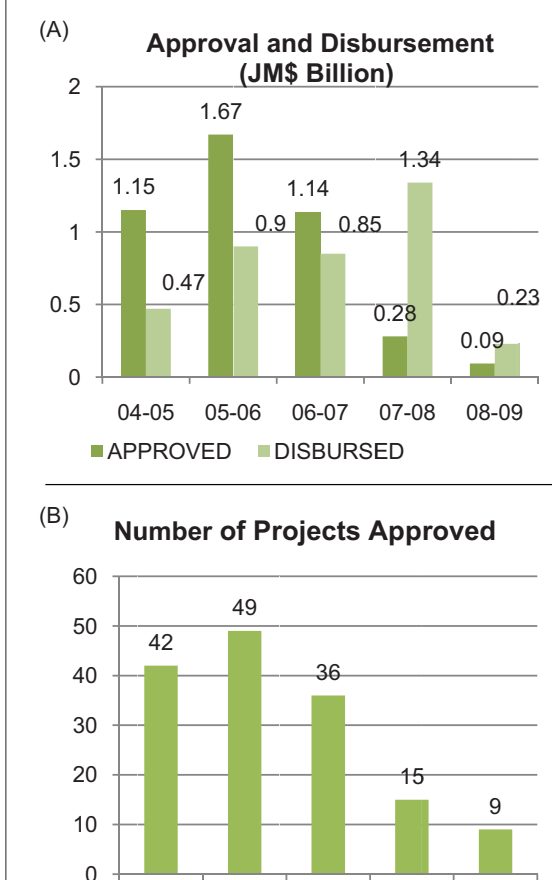
One of the major steps the government of Jamaica has taken to deal with NCDs is the establishment of the NHF. This was created under the National Health Fund Act in 2003. Its main objective is to reduce the cost of treatment for NCDs by providing free or subsidized medicines to patients with a number of NCD conditions. The NHF also finances prevention programs, principally the Healthy Lifestyles Program administered through the Ministry of Health and Environment (MOHE).

Institutional Benefits

The NHF provides grants to public and private institutions to support activities related to health promotion and chronic disease prevention. Institutions must submit a project proposal to the NHF to become eligible for institutional benefits; this is evaluated by an NHF committee using the national healthcare priorities defined by government.

The NHF also provides institutional benefits in the form of grants to two sub-funds under the institutional benefits program: the Health Promotion Fund and the Health Support Fund. The Health Promotion Fund finances public and private-sector health-promotion and disease-prevention programs and takes up at least 10 percent of NHF revenues. The Health Support Fund assists public agencies by financing infrastructure development such as the purchase of equipment and renovation, and the refurbishment and construction of health facilities. The operations of the Health Support Fund take up at least 15 percent of annual NHF revenues. Figure 23 shows the number of projects approved and their rate of approval and disbursements.

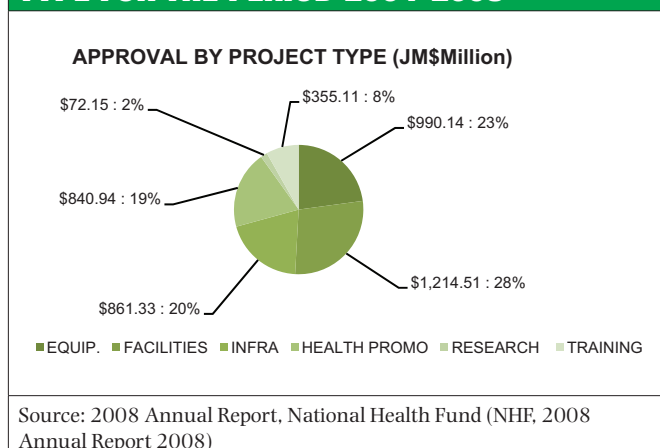
FIGURE 23. (A) RATES OF APPROVAL AND DISBURSEMENT OF INSTITUTIONAL BENEFIT PROJECTS, 2004-2008 AND (B) NUMBER OF (INSTITUTIONAL BENEFITS) PROJECTS APPROVED, 2004-2008



Source: 2008 Annual Report, National Health Fund (NHF, 2008 Annual Report 2008)

During 2008, JMD842.02 million was approved for institutional benefit projects. Of this, JMD763.37 million was approved for twenty-five new projects while additional funding of JMD78.65 million was approved for existing projects (Figure 24). Seven projects in Construction and Infrastructure received JMD529.56 million, the lion's share of the funding for approved projects. Health Promotion received JMD123.29 million, Equipment JMD121.84 million, and Research JMD67.33 million. Non-Governmental Organizations had the greatest number of grants approved with 14 projects, the Ministry of Health had 10 projects approved, and 4 projects were approved for the South East Regional Health Authority, 2 for the Western Regional Health Authority, and one for the Southern Regional Health Authority.

FIGURE 24. NHF APPROVAL BY PROJECT TYPE FOR THE PERIOD 2004–2008



In 2007, health promotion projects accounted for the largest share of approved financing – JMD185.20 million (US\$2.47 million). This amount was reallocated to projects related to Research (JMD25.63 million; US\$0.34 million), Training (JMD24.45 million; US\$0.32 million), Construction and Infrastructure (JMD27.24 million; US\$0.36 million), and Equipment (JMD16.20 million; US\$0.22 million). In the 2007 fiscal year, 34 projects were completed and funds worth JMD502.07 million (US\$6.71 million) were disbursed (NHF, 2008 Annual Report 2008).

Individual Benefits

The NHF responded to the need for public-sector support to help individuals address their NCD needs. The macroeconomic recession at the beginning of this decade caused high unemployment and escalated global healthcare costs; this made it increasingly difficult for households where family members have multiple chronic conditions to afford the high cost of medicine to treat and control them. More than half of total health expenditure went on private health services, of which 83 percent was out-of-pocket expenditure, mainly for pharmaceuticals (World Health Organization 2009).

One of the major functions of the NHF is to provide an Individual Benefit Package and at least 50 percent of the NHF budget has been allocated for individual benefits. All residents of Jamaica (except tourists, in-transit passengers, and temporary workers with a work permit for less than one year) suffering from NCDs are eligible for enrollment into the Jamaica Drug for the Elderly Program (JADEP) and/or NHF Card Program. Beneficiaries over 60 years of age enrolled in the JADEP program are provided with free drugs to treat 10 chronic diseases that are most prevalent among the elderly (hypertension, diabetes, glaucoma, heart disease, arthritis, asthma, vascular conditions, psychosis, benign prostate hyperplasia, and high cholesterol). The NHF Card subsidizes drugs for people of all ages and covers 15 chronic illnesses (arthritis, asthma, benign prostatic hyperplasia or enlarged prostate, diabetes, ischemic heart disease, breast cancer, epilepsy, high cholesterol, major depression, rheumatic heart disease, glaucoma, prostate cancer, psychosis,

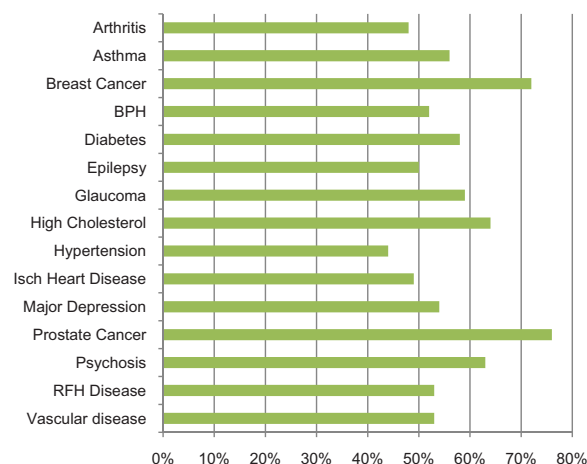
vascular disease, and hypertension). The selection of medicines to be subsidized or provided free of charge was based on the most common NCD conditions and their potential financial implications for patients.

As part of the individual benefits package, JADEP was launched in 1996 by the Ministry of Health as a national social assistance program to cover Jamaicans who are sixty years of age or older with a diagnosis of one or more chronic diseases. The NHF took over the JADEP Program from the Ministry of Health and has been running it smoothly. The Program's main objectives are to provide basic drugs to the elderly, improve access to pharmaceuticals, and promote rational drug use. JADEP beneficiaries can also join the NHF Card program. The JADEP Program covers the cost of 72 prescription items and 8 medical-surgical supplies. The average monthly expenditure for the Program is about JMD20 million (US\$2.68 million). By the 2009 fiscal year, 18,364 beneficiaries were enrolled in the JADEP Program, and a total of 344 pharmacies provided JADEP benefits. The major share of JADEP beneficiaries (65.9 percent) are in the 65–74 age group, with females accounting for approximately two-thirds (62 percent). Beneficiaries of the NHF Card are automatically enrolled in the JADEP program at the age of 60.

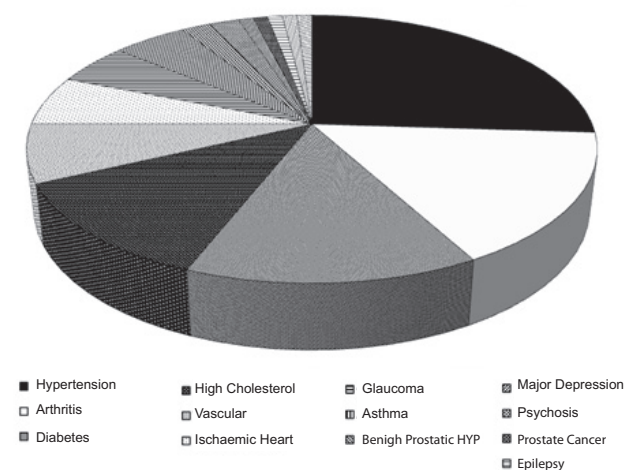
The NHF Card program was developed as part of the individual benefits package to provide subsidies for specified drugs to help beneficiaries meet the costs of medicine. Subsidies are based on market prices from the most economical sources and beneficiaries are often required to co-pay. Initially, NHF beneficiaries were eligible to purchase 182 drugs at a subsidized price in 200 Provider Pharmacies across the country. By the 2009 fiscal year, the total number of items on the NHF Drug list had reached 1,288 and the total number of Provider Pharmacies had increased to 422; the total number of Active Pharmaceutical Ingredients was 201. In November 2005 the NHF Board approved an average of 57 percent out of a total of 1,887,739 prescriptions filled for the subsidy, the total value of which was JMD 2,386 billion, and the NHF paid out JMD 1,371 billion in subsidies. Figure 25 illustrates the NHF Card subsidy rates in the 2008 fiscal year.

NHF Card beneficiaries registered for 546,285 cases of illnesses in the 2008 fiscal year, which is an average of 2.62 cases per individual (Figure 26). Hypertension has the highest enrollment with over a quarter (26 percent) of the total number of cases, followed by arthritis (16 percent), diabetes (14 percent), and high cholesterol (12 percent).

More people are taking advantage of the Program with an increase in the numbers enrolled in the NHF Card Program. In 2007, the total number of cases of illnesses for which the NHF Card beneficiaries were eligible reached 436,555 or an average of 2.53 cases per individual. In the 2008 fiscal year, a 20 percent increase in the NHF enrollment rate (from 291,390 to 350,304) was observed and it reached a total of 2.4 million claims.

FIGURE 25. NHF CARD SUBSIDY RATES

Source: 2009 Annual Report, National Health Fund (NHF, 2009 Annual Report 2009)

FIGURE 26. NHF CARD ENROLLMENT BY CASES

Source: 2009 Annual Report, National Health Fund (NHF, 2009 Annual Report 2009))

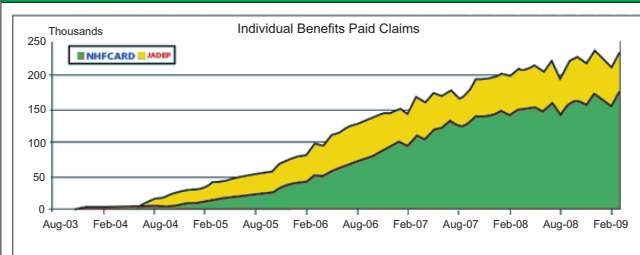
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The NHF has provided its beneficiaries with flexibility in choosing a pharmaceutical provider, which has raised the demand for private health services. In 2008, over 90 percent of claims were filled by private providers, with a network that expanded to a total

of 422 locations. The new scheme also intensified competition among pharmacies that limited price increases for medications on the NHF drug list.

A patient needs to be certified by a public or private provider and be registered with the NHF to be eligible for benefits. By the 2009 fiscal year, over 80 percent of those enrolled for the NHF Card were over 45 years of age. There are almost twice as many females (64 percent) as males enrolled for the NHF Card. Once approved, the patient receives a magnetic swipe card with which to purchase drugs from participating pharmacies at rates negotiated by the NHF. Beneficiaries may be asked to pay a pharmacy fee of up to Jm\$60 (US\$0.80) per item.

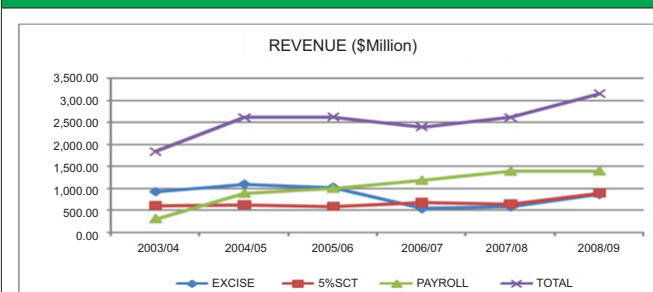
Eligible beneficiaries can enroll in the NHF Program at any government health center, the national council for senior citizens, or the NHF head office and its branches by providing the national identification card and documents certifying their age. Application documents for both JADEP and NHF enrollment are available online through the NHF website. Personal appearance for enrollment in the JADEP program is not required for seniors as long as they submit the required documentation through an entrusted person. The number of JADEP enrollees is gradually increasing owing to active outreach and public information programs. The overall number of claims satisfied for NHF and JADEP during 2008 fiscal year reached 2,601,729 prescriptions (Figure 27).

FIGURE 27. NHF INDIVIDUAL BENEFITS BETWEEN 2003 AND 2009 – NUMBER OF CLAIMS PAID BY NHF CARD AND JADEP

Source: 2009 Annual Report, National Health Fund (NHF, 2009 Annual Report 2009)

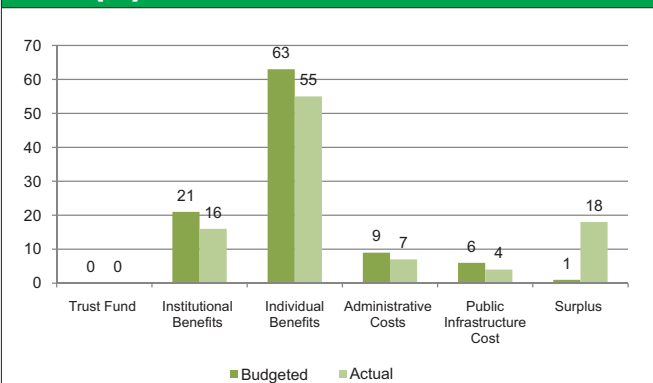
NHF Revenue Sources and Allocations

The NHF collects its revenues from tobacco excise tax, special consumption tax (imposed on petrol, alcohol, and motor vehicles) and payroll tax on annual earnings paid by employees and employers (Strachan 2010). Figure 28 illustrates the distribution of NHF revenue sources between fiscal years 2003 and 2008.

FIGURE 28. NHF SOURCES OF REVENUE

Source: National Health Fund presentation to the World Bank team, 2009

The tobacco excise tax contributed the largest share (23 percent) up to 2006, when the major national tobacco producer (Carreras Limited) relocated to Trinidad and Tobago. From 2006 to the present, payroll taxes have contributed most of the NHF budget, namely 50 percent in 2006/07, 53 percent in 2007/08, and 44 percent in 2008/09. By the end of 2008, payroll taxes contributed JMD500 million (US\$6.69 million) more than excise and special consumption taxes. In 2009, the tobacco excise tax contributions increased again, making up 28 percent of the total (Strachan 2010). Meanwhile, the major share of NHF funds is allocated to the Individual Benefits Program (Figure 29).

FIGURE 29. NHF INCOME ALLOCATION IN 2008 (%)

Source: Formal presentation of the NHF finance and institutional benefits to the World Bank mission

Approximately 36 percent of Jamaicans (33 percent of men and 40 percent of women) reported having heard of JADEP. Awareness was lowest in the 15–24 age group and highest in the over-65 age group (52 percent). Within all age groups, there was higher awareness among females than males.

Small differences exist between urban and rural dwellers in awareness and enrollment for the NHF Card. A higher proportion of urban males than rural ones is aware of the NHF Card but among females the reverse is true. There are no differences in awareness of the JADEP program between urban and rural groups. Of the 60-and-over age group, 23.7 percent (28.5 percent of women and 18.4 percent of men) were enrolled in the JADEP program. The most common reasons for the use of the NHF/JADEP cards were the desire to save (86.8 percent) and encouragement from a healthcare professional (14.3 percent).

Enrollment of persons with eligible disease conditions has been relatively low as of 2008. Table 13 shows the proportion of eligible persons who access NHF Card and JADEP benefits. Uptake of benefits for eligible conditions under the NHF Card Program was reported in less than 50 percent of cases overall. Benefits were accessed in more than 50 percent of cases among females only for cases of glaucoma (57 percent), diabetes mellitus (52 percent), and high cholesterol (51 percent), and among males for stroke (59 percent). The highest uptake rates are for diabetes mellitus (50 percent), glaucoma (49 percent), and high cholesterol (47 percent). Conditions with the lowest uptake of benefits include asthma (12 percent), mental health problems (1.6 percent), and enlarged prostate (26 percent).

Less than half of the JADEP eligible population is enrolled in the Program. Only ten percent of those stating they were hypertensive are enrolled in JADEP. The highest uptake of JADEP benefits is for cancer (100 percent of men and 47 percent of women) while there was moderate uptake by both sexes for diabetes mellitus, high cholesterol, glaucoma, and circulation and for asthma and arthritis among females and enlarged prostate among males.

Program Awareness and Enrollments

Awareness of NHF Card and JADEP among Jamaicans is high. The Jamaica Health and Lifestyle Survey conducted in 2007–8 among 2,848 respondents aged 15–74 years identified that 77 percent of the population (74 percent of men and 80 percent of women) had heard of the NHF Card program and 9.5 percent (7.1 percent of men and 11.9 percent of women) were enrolled in the NHF Card program. A higher proportion of women across all age categories has heard of the NHF Card with older women were more aware of the services than younger women while the proportion of men who have heard of the fund did not vary significantly with age.

TABLE 12. PERCENTAGE OF ENROLLMENT IN NHF CARD AND JADEP PROGRAM BY AGE GROUP AND GENDER

AGE GROUPS	NHF CARD						JADEP					
	EVER HEARD			ENROLLED			EVER HEARD			ENROLLED		
	MALE	FEMALE	ALL	MALE	FEMALE	ALL	MALE	FEMALE	ALL	MALE	FEMALE	ALL
15–24	69.1	72.3	70.7	2.5	2.9	2.7	14.4	24.3	19.4	0	0	0
25–34	72.6	77.9	75.4	1.3	2.4	1.8	21.9	35.7	29.2	0	0	0
35–44	74.4	79.5	77.0	4.5	8.7	6.6	44.9	41.0	42.9	0	0	0
45–54	79.3	87.3	83.3	13.0	19.2	16.0	53.0	54.0	53.5	0	0	0
55–64	76.7	89.8	83.1	17.3	29.7	23.4	44.8	56.7	50.7	5.1	8.3	6.7
65–74	74.2	87.9	81.4	28.5	54.5	42.0	45.4	57.5	51.7	22.3	34.3	28.6
Total	73.5	79.7	76.7	7.1	11.9	9.5	32.9	39.6	36.3	1.9	3.0	2.5

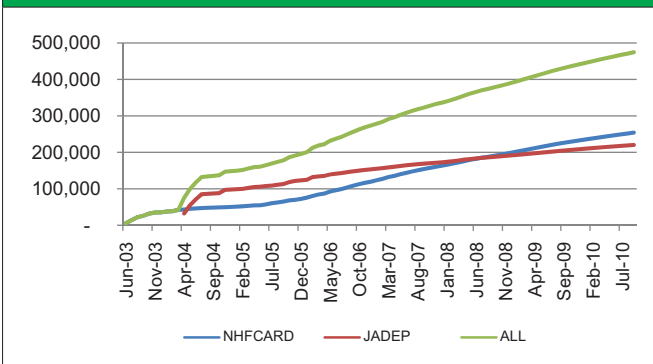
Source: JHLSII, 2008 (Wilks, et al. 2008)

TABLE 13. DISEASE CONDITIONS OF NHF CARD AND JADEP BENEFICIARIES

DISEASE CONDITION	NHF CARD PROGRAM			JADEP PROGRAM		
	MALE	FEMALE	TOTAL	MALE	FE-MALE	TOTAL
Heart Disease	33.3	33.5	33.4	13.0	52.4	39.1
Diabetes Mellitus	47.1	51.6	49.8	45.6	37.0	40.7
Glaucoma	41.5	56.9	49.4	39.1	37.2	37.8
Hypertension	33.0	27.8	29.2	12.6	9.1	10.0
High Cholesterol	38.9	51.4	47.1	36.7	49.1	45.6
Stroke	58.7	28.6	42.1	17.8	19.3	18.5
Kidney Disease	11.0	15.1	13.4	0	100	25.0
Overweight/Obese	6.8	18.9	16.1	22.6	36.6	34.8
Circulation	40.3	38.0	38.6	48.0	33.1	37.6
Enlarged Prostate	26.1	N/A	26.1	45.6	N/A	45.6
Arthritis	30.9	42.0	39.7	25.3	41.5	37.2
Sickle Cell Disease	0	11.6	8.7	N/A	N/A	N/A
Asthma	10.1	12.8	11.7	0	54.6	28.0
Cancer	43.1	48.5	47.1	100	47.1	51.2
Mental Health Problems	8.2	21.6	16.3	0	25.4	17.0
Epilepsy	0	10.5	7.0	0	37.5	37.5

Source: JHLSII, 2008 (Wilks, et al. 2008)

NHF and JADEP enrollment is increasing considerably over time. According to NHF administrative data (Figure 30), enrollments for NHF increased from 50,000 in December 2004 to 260,000 in July 2010 – a fivefold increase in six years. JADEP participants increased from 100,000 to 220,000, resulting in a total of 480,000 program beneficiaries by the summer of 2010.

FIGURE 30. NHF CARD AND JADEP ENROLLMENT BETWEEN 2003 AND 2010

Source: NHF 2009 (NHF, 2009 Annual Report 2009)

The JHLSII 2007–8 Report summarized the main reasons given for non-participation by those eligible for NHF. The main reasons given were difficulty with the enrollment process and not wanting to make the effort, while having other health insurance and the lowness of the subsidies were other reasons given. Only very few people did not enroll in for lack of qualifying information or birth certificate, or because drugs were not covered. Not meeting the age criterion excluded over 70 percent of otherwise eligible people from enrolling in the JADEP Program.

Of the persons participating in the NHF Card or JADEP Programs, only about a quarter used their NHF and JADEP cards on a regular basis (Table 14). There was no significant difference in the amount of regular usage of each of these cards: 10 percent more males than females never used their JADEP card, while the proportion was roughly the same for female and male NHF Card participants. Over 85 percent of those enrolled for the NHF Card and JADEP used their benefit cards. Encouragement from a healthcare professional was given as a common reason for using both cards.

TABLE 14. NHF AND JADEP CARD USAGE AMONG ENROLLEES BY GENDER (%)

	NHF			JADEP		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Never	23.5	23.9	23.8	24.6	14.3	18.1
Seldom	24.8	19.5	21.4	5.1	9.3	7.7
Occasionally	20.2	16.9	18.1	24.6	28.0	26.7
Regular	31.6	39.6	36.7	45.6	48.4	47.4

Source: JHLSII, 2008 (Wilks, et al. 2008)

CHRONIC DISEASE PREVENTION PROGRAMS

The government's National Strategic Plan, "Vision 2030 Jamaica", 2009, aims to advance the country's status to developed nation by 2030. With guiding principles of social cohesion, equity, and sustainability, its goal is to provide citizens with the best quality of life and world-class standards in education, healthcare, nutritional status, basic amenities, access to environmental goods and services, civility, and social order. The national health strategies for 2006–2015 seek to expand the healthy lifespan of its people and encourage the population to take greater responsibility for their own health. The MOHE encourages health promotion via education activities in the national curriculum to influence youth to change behavior to reduce the incidence of chronic diseases, high-risk sexual behavior, and violence. The government promotes physical activity, healthy diet, marketing of healthy foods, and reduction of alcohol and tobacco use through the education sector and in cooperation with the mass media, NGOs, and other national and international avenues.

The MOHE Chronic Disease Unit is implementing prevention programs for NCDs, including diabetes, hypertension, cancer, and coronary artery disease (Ministry of Health Jamaica 2009). These are described below:

- **Cardiovascular Disease:** The Heart Foundation of Jamaica focuses on educational intervention and screening programs to reduce the incidence of death from heart disease. Services offered include heart screening, counseling and education, home visits, and tobacco cessation programs. The MOHE initiated smoking prevention among adolescents but does not have intervention programs specifically designed

for cardiovascular diseases. The programs also address hypertension.

- **Diabetes Mellitus:** The efforts in this area are mainly activities for promoting general awareness of risk factors for chronic diseases and guidance to adopt supportive lifestyles and behavior in communities.
- **Cervical Cancer Screening:** The MOHE Cervical Cancer Screening program targets adult women aged 25–54 years of age at risk for cancer of the cervix. The number of women screened increased by 18 percent from 49,754 in 2006 to 58,648 in 2007. Screening is conducted by public health nurses and midwives in the field. The Jamaica Cancer Society also screens for cervical cancer, reaching an additional 24,378 women in 2007.
- **Breast Cancer Screening:** The Jamaica Cancer Society also provides breast cancer screening services. In 2007, 7,102 people received mammograms, and 23.2 percent of these occurred in a mobile unit. Women aged 40–49 were at the highest risk of breast cancer, accounting for 39 percent of those having mammograms.

HEALTHY LIFESTYLE PROGRAM

The national policy for the promotion of healthy lifestyles in Jamaica is intersectoral. It involves the public and private sectors, government and non-governmental organizations, and communities to address critical health issues. The goal of the policy is to decrease the incidence of chronic diseases, high-risk sexual behavior, violence, and injury through behavior change among all age groups but with a focus on youth and adolescents.

The government plans to implement healthy lifestyle policies in line with Vision 2030. These policies aim at empowering communities, developing healthy lifestyle skills, building more green-zone recreational facilities, encouraging smoke-free environments, supporting school and household nutrition and mental-health programs, taking into account the gender dimension, and providing reproductive health services (Planning Institute of Jamaica 2009).

A government project under the healthy lifestyle national policy seeks to improve health status through improved socioeconomic conditions, addressing cultural issues, and changing dietary habits. As part of the overall strategy, the project aims to build awareness of healthy lifestyles through media shows, educational activities at workplaces, schools, clubs, churches, communities, sport facilities and health facilities, and the integration of behavior modification activities into treatment programs for those affected by lifestyle diseases. More specific project objectives will address chronic diseases and reproductive health issues, and reduce risky behavior. The project promotes higher levels of physical activity, increased availability and consumption of healthy foods, and reduced smoking. On reproductive health, the project aims to reach pre-adolescents, adolescents, and youth through educational interventions. The project also seeks to address behavior leading to violence, unintentional injury, and suicide.

A major component of the Healthy Lifestyle Program includes several projects that target specific population groups to promote health:

- The Healthy Lifestyle School Program introduces a cheerleading program that goes beyond promoting the physical activity, sharing information on the risks of unprotected sexual activity, drug usage, unhealthy eating habits, conflict resolution, and environmental concerns.
- The Healthy Zones Program is the community-based physical-activity-promotion program that encourages its members to work closely with each other to foster a healthy way of life.
- The Camp Yellow Bird Program provides children and adolescents affected with diabetes with an active and safe camping experience, offering education on diabetes and management skills.
- The Teens “R” Terrific Program trains teens to be promoters through involvement in camps where they develop life skills and develop plans for sharing knowledge when they return to their schools and communities.
- The Camp for the Healthy Way is a behavioral intervention targeting obese young people aged 10–19 attending secondary-level schools (primary and junior high, high, and technical) across Jamaica, providing participant follow-up over a period of a year to track improvements in their body mass index (BMI).
- The Workplace Wellness Program combines efforts by employers and employees to improve the health and wellbeing of people at work.
- Community Health Days, Health Fairs and other sponsored events are interventions to make public information prepared by the NHF to encourage Jamaicans to take responsibility for their own health.

There is very little information on the results or impact of these prevention programs in Jamaica. Despite many prevention programs having been implemented or under implantation, there is little data on coverage, results and effectiveness of these programs.

This chapter has examined the response of Jamaica to NCDs and considered the success and shortcomings of its policies and programs. The next chapter will assess the impact which some programs have had on the lives of people in Jamaica, distinguishing the impact on the different demographic sub-groups in the country.

6. IMPACT OF NCD-RELATED POLICIES AND PROGRAMS ON PEOPLE'S LIVES

This chapter assesses the initial impact of Jamaica's NCD Programs on people's lives. Previous sections of this study illustrated an effort by the government of Jamaica to assist financially people living with NCDs. No impact evaluation has been carried out to assess the effectiveness of these programs. This study uses available data to measure the impact of the NHF. It was established in 2003 and it is still too early to assess the full impact on NCDs. Data to assess the socioeconomic impact of the prevention and control programs are very limited. Nevertheless, repeated cross-sectional Jamaica Living Conditions Surveys provide nationally representative data on individual and household healthcare utilization, giving a unique opportunity to assess changes in patterns of seeking healthcare before and after the introduction of the NHF.

The chapter considers which population groups benefit most from the NHF Program to determine (a) whether its establishment has helped to reduce out-of-pocket spending on healthcare for NCD patients, and (b) how patients with NCDs utilizing healthcare fared

compared to non-chronic disease patients. The hypothesis is that, by providing free or subsidized medicines to eligible NCD patients, the NHF would reduce NCD patients' out-of-pocket expenditure and make their treatment more affordable and that therefore NCD patients would be more likely to avail themselves of health services than those patients without chronic disease. Because of the government's policy of abolishing user-fees at public health facilities, which was introduced in 2008 and which may affect healthcare utilization of both NCD patients and non-chronic disease patients, the analysis of the impact of the NHF applied data for 2007 and earlier so as to rule out the impact on the results of removing user-fees in public health facilities. There are other confounding factors that influence healthcare-seeking behavior, however, which this study cannot control. Thus the analysis does not attempt to attribute healthcare-seeking behavior changes solely to the introduction of NHF, but rather to compare utilization patterns before and after the implementation of the policy.

Key Findings

1. The NHF drug subsidy program has achieved its primary goal of making NCD drugs more affordable. NCD patients under the NHF paid less for pharmaceuticals than NCD patients without it.
2. Prescribing drugs constitutes treatment and does not prevent disease.
3. NHF and JADEP card coverage remains limited and uneven, despite broad awareness among Jamaicans.
4. Distribution of NHF benefits is unequal among socioeconomic groups. The rich benefit more from the drug subsidy program and spent 36 percent less on drugs in 2007 than they did in 2000 before the establishment of NHF. They are also more likely to join NHF and JADEP Programs. The NHF has not reached the poor; reduction in drug expenditure of the poor was less than 2 percent between 2000 and 2007.
5. People with NCDs in general spent less on pharmaceuticals but more on medical services.
6. The total medical expenditure for NCDs did not show a reduction after the introduction of the NHF as the savings on pharmaceuticals were spent on more medical consultations.
7. The increase in healthcare facility visits is largely due to a huge increase in attendance by the richest persons with NCDs.

HAS HOUSEHOLD HEALTHCARE EXPENDITURE ON NCDS DECLINED?

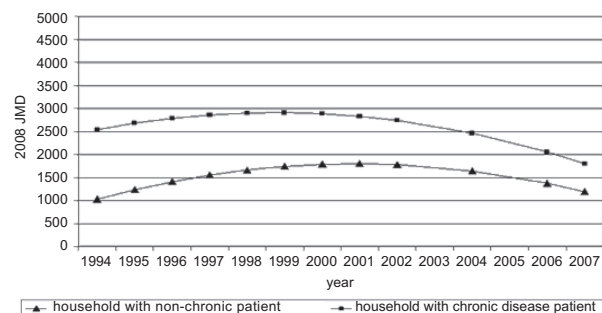
The analysis has found that expenditure on medicines declined overall in recent years and faster for households with a member with chronic disease than for households with a patient with a disease that is not chronic. After ruling out the effect of time trend changes on household socioeconomic characteristics, household per-capita healthcare expenditure presents as an inverse U curve (Figure 31), with the turning point around 2001–2002. Although households with patients with chronic disease spent more on medicines in each year, the gap between these and households with a patient suffering from a non-chronic disease reduced significantly, from JMD1500 (US\$20.07) in 1994 to only JMD600 (US\$8.03) in 2007. While this result does not directly support the conclusion that it was the introduction of NHF and JADEP that led to reduced medicine expenditure for patients with chronic disease, the converging trend for the two types of household suggests at the least that the household burden of NCDs experienced in the 1990s was reduced from the early 2000s.

Time trends analysis used to examine household annual health expenditure. The analysis looks at two components: (1) household expenditure on medicine including pills, tonics, drugs, family-planning supplies, herbal medicines, mechanical contraceptive devices, condoms, IUDs, etc.; and (2) household medical service expenditure including doctor's fees, hospital care, prescriptions, spectacles, and laboratory fees. Historical healthcare expenditure data are derived from JSLC during the period 1994–2007.

The primary goal in this analysis was to determine whether households with chronic-disease patients spent more on healthcare than households with a member with a non-chronic disease before and after the introduction of NHF. Similar to other time trend analyses in this report, a regression model was used to adjust for demographic and socioeconomic changes in healthcare expenditures. Explanatory variables included in the regression model are region of household residence, population quintile, household member disease type (chronic or non-chronic disease), household member health insurance cover, household sanitation characteristics (toilet, lighting, and water source), and household per-capita alcohol and tobacco use. Time variables captured the trend over time. Household per-capita expenditure instead of individual expenditure is used for this analysis because survey questions at the household level are consistent in JSLC over the study period. The study sample therefore focused on households that have at least one member suffering from chronic or non-chronic diseases¹².

¹² Households are excluded from regression if both chronic and non-chronic disease members are present

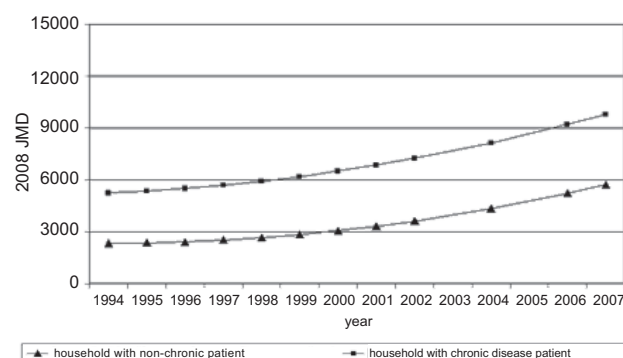
FIGURE 31. ADJUSTED ANNUAL PER-CAPITA DRUG EXPENDITURE FOR HOUSEHOLD WITH CHRONIC DISEASE PATIENT AND HOUSEHOLD WITH NON-CHRONIC DISEASE PATIENT (2008 JMD)



*adjusted for household socioeconomic characteristics
Source: Studies estimates based on JSLC 1994–2007

In contrast to the pattern observed in medicine expenditure, the cost of medical services for households with a member with a chronic disease was consistently higher than for households with a member with a non-chronic disease. This reflects a time trend between households that is generally in parallel. In 1994, the cost for a family with a member with a chronic disease was nearly double that for a family with a member with a non-chronic disease; after 15 years, the cost disparity remains double between the two types of families (Figure 32). In general, medical services impose an increasingly heavy out-of-pocket economic burden on households whose members are suffering from any type of disease.

FIGURE 32. ADJUSTED ANNUAL PER-CAPITA MEDICAL EXPENDITURE FOR HOUSEHOLD WITH AND WITHOUT CHRONIC DISEASE PATIENT (IN 2008 JMD)



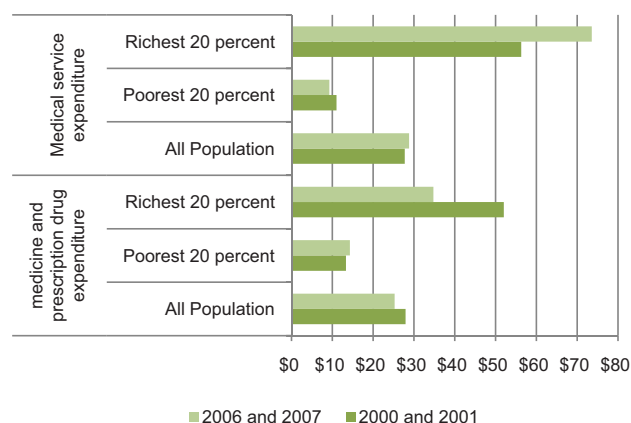
*adjusted for major household socioeconomic characteristics
Source: Studies estimates based on JSLC 1994–2007

The analysis concludes that people with NCDs in general spent less on medicines and prescription drugs but more on medical services. Pre- and post descriptive statistics confirm the results of the time-trend analysis and suggests that individuals suffering from

NCDs reduced their medicine and prescription drug expenditure on average by roughly 10 percent in 2006 and 2007 after the NHF drug purchase subsidy program was introduced, relative to 2000 and 2001. In contrast, medical service expenditure presents an upward pattern from JMD27,755 (US\$371.36) per capita in 2000–2001 to JMD28,817 (US\$385.57) per capita in 2006–2007, an increase of around JMD1,000 (US\$13.38) during this short period (Figure 33). It should be noted that affordable drugs did not only result from NHF and JADEP cards; the NHF 2008 Report pointed to responsive behavior by pharmaceutical providers as a result of increased competition that limited price increases, especially as new generic brands for active ingredients on the NHF Drug List were introduced onto the market.

The absolute difference between poor and rich is narrowing in drug expenditure after NHF implementation but the richest quintile benefited most from the program in terms of reduced spending on drugs. Figure 33 also summarizes the healthcare expenditure pattern for the poorest NCD population (population quintile 1) and richest NCD population (population quintile 5). Although the gap between poorest and richest quintiles in spending on prescription and other medicines reduced, with a nearly 90 percent decrease from JMD38,700 (US\$517.81) to JMD20,480 (US\$274.02) from 2000 to 2007, this reduction was driven primarily by the cost saving among the richest population, while the poorest population incurred more or less the same expenditure. By contrast, the disparity between poorest and richest in medical service expenditure is greater, with the poorest spending less.

FIGURE 33. INDIVIDUAL ANNUAL¹³ MEDICAL EXPENDITURES BEFORE AND AFTER NHF PROGRAM AMONG NCD POPULATION (IN 1000 2008 CONSTANT JMD)

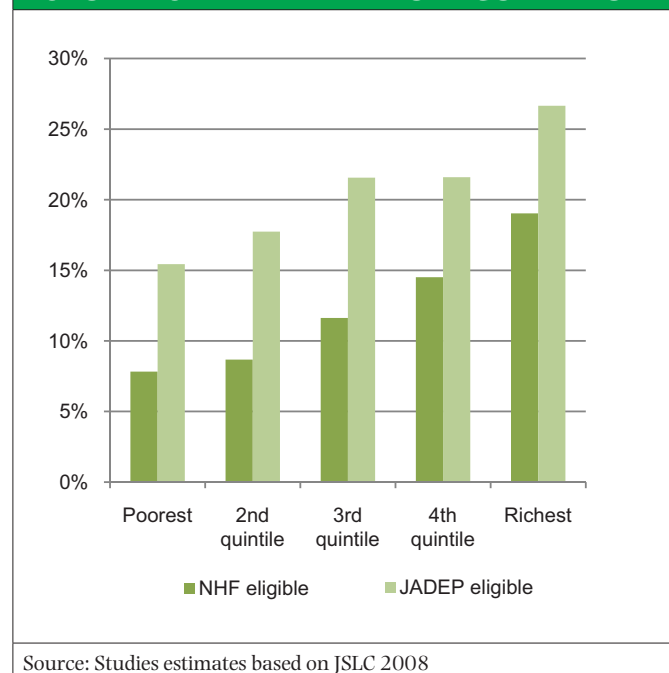


*adjusted for major household socioeconomic characteristics
Source: Studies estimates based on JSLC 1994–2007

¹³ Two-year expenditure data were combined and annualized for before-NHF period 2000 and 2001 and after-NHF period 2006 and 2007, in order to expand study sample size

Richer people are the major beneficiaries of NHF card and JADEP Program. More NHF Card and JADEP beneficiaries come from the upper income quintile levels. Among the population eligible for the NHF Card, the probability¹⁴ of enrollment is 11.2 percentage points higher for the richest at 19.0 percent, while the probability of enrollment for the poorest is only 7.8 percent; among the population eligible for the JADEP Program, the difference in probability of enrollment is similar at 11.2 percentage points, with a probability of 15.4 percent for the poorest and 26.6 percent for the richest (Figure 34). The disparity in enrollment between poor and rich implies that NHF has not effectively targeted the poor. The data also show that females, the elderly, urban residents, those currently of poor health status by their own report, and those who already have medical insurance are more likely to enroll in NHE.

FIGURE 34. PROBABILITY OF NHF AND JADEP ENROLLMENT AMONG ELIGIBLE POPULATION BY EXPENDITURE QUINTILES



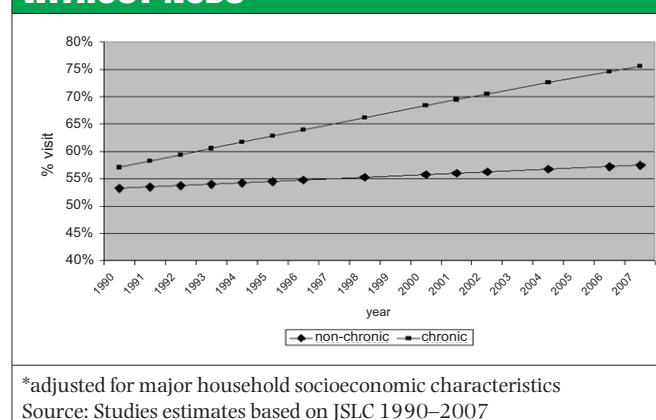
NHF funds did not achieve their desired goal in reducing drug cost, viewed from a welfare-economics perspective. The richest population who could afford drug expenditure before the program were actually better off, and the poorest quintile that are the policy target remained in the same situation with or without NHF funds. The JSLC survey did not provide enough data to evaluate the reasons behind the substantial decrease in medicine and drug costs and the increase of medical service expenditure for the richest. A possible interpretation is that the NHF and JADEP Programs attracted more rich than poor; hence, the overall drug cost reduction is larger for the rich. Although the reason for the poor to opt out is unclear, co-payment and concerns over application processes may play a role.

¹⁴ Probability of enrollment is predicted by a binary choice model, controlling for individual basic socioeconomic characteristics including gender, age, self-reported health status, population quintiles, marital status, and medical insurance coverage

HAVE HEALTH SERVICE VISITS INCREASED?

Health service visits among NCD patients showed an upward trend as opposed to a fairly flat curve among non-NCD patients. Figure 35 illustrates that NCD patients on average had more healthcare visits than non-NCD patients, and this gap was substantially larger, rising from 3.8 percent in 1990 to 18.0 percent in 2007, almost a six fold increase in 17 years. Although it is hard to conclude that it is the implementation of NHF programs that led to this profound change in care-seeking behavior, NCD patients are obviously accessing healthcare services more.

FIGURE 35. ADJUSTED HEALTH SERVICE VISITS (%) FOR INDIVIDUALS WITH AND WITHOUT NCDs



The analysis given above in respect of health services followed the same methodology to determine whether individuals with and without NCDs had the same level of visits over time, especially before and after NHF introduction in 2003–2004. Explanatory variables included in the regression model include age, gender, education, region of residence, disease type (chronic disease or non-chronic disease), health-insurance cover, population quintile, and marital status. Again, time variables captured the trend over time. The primary goal of this analysis was to determine whether individuals with and without NCDs had the same level of health service visits across time, especially before and after NHE. Therefore the study sample focused on all adult individuals suffering from chronic or non-chronic diseases. Healthcare service visits include any visit to a doctor, nurse, pharmacist, midwife, healer, or any other health practitioner. JSLC 1990–2007 served as the data source for this analysis.

Pre- and post-descriptive statistics confirmed the time-trend analysis results that people with NCDs in general increased their utilization of health services. The proportion of people living with NCDs has increased over time. The NCD population visiting health service facilities increased by approximately 5–6 percent, from 70 percent in 2001 to 76 percent in 2006, after implementation of the Program (Table 15). The average number of visits per patient slightly decreased (1.6 versus 1.3) before and after NHE. The proportion of public-facility visits, including public hospitals and public centers, did not reveal a significant change (45 percent

versus 44 percent). With regard to prescription drug purchases, pre- and post-descriptive statistics for the whole NCD population did not show a noticeable difference either. During this period health insurance coverage expanded rapidly, however, from only 13 percent for NCD patients in 2001 to 24 percent in 2006, almost doubling in 5 years.

TABLE 15. INDIVIDUAL HEALTH SERVICE UTILIZATION BEFORE AND AFTER THE NHF PROGRAM AMONG NCD POPULATION

	2000 AND 2001			2006 AND 2007		
	ALL NCD POPULATION	POOREST 20%	RICHEST 20%	ALL NCD POPULATION	POOREST 20%	RICHEST 20%
Health service visits (%)	70	71	69	76	73	77
Number of visits	1.6	1.7	1.5	1.3	1.3	1.2
Public facility visits (%)	45	69	31	44	64	28
Medication purchase (%)	79	66	85	78	72	81
Insurance Coverage (%)	13	4	26	24	17	35

Source: Studies estimates based on JSLC 2000, 2001, 2006 and 2007

This chapter has examined the impact of the country's policies and programs on the different groups of people in Jamaica; the following chapter turns to a consideration of the economic impact of NCDs on society and on the individuals in these different groups.

7. ECONOMIC IMPLICATIONS OF NCDs

This chapter estimates the economic burden of NCDs on individuals, including direct costs from outpatient visits, inpatient care, purchase of medicines, and indirect costs from income loss associated with the disease. The analysis in this chapter includes an assessment of the economic burden resulting from the four most prevalent, costly, and disabling chronic conditions in Jamaica: asthma, diabetes, hypertension, and arthritis. This chapter also includes a trend analysis of household out-of-pocket expenditure owing to NCDs during the period from 1994 to 2007.

Key Findings

1. NCDs have resulted in a large direct and indirect economic burden for individuals in Jamaica. An average individual suffering from NCDs uses approximately one-third of household income (JM\$55,503) on healthcare services and medicine purchases.
2. Direct healthcare costs associated with NCDs were regressive, imposing a greater burden on poor households than on better-off households.
3. Hypertension was by far the most costly chronic condition, followed by diabetes and arthritis, while indirect income loss associated with arthritis was the largest.
4. The richest population quintile incurred an economic burden from NCDs almost seven times the national aggregate compared to the poorest.
5. National aggregate out-of-pocket health expenditure amounted to JM\$33,813 million (US\$452 million), or 3.08 percent of Jamaica's GDP. The total economic burden on individuals including indirect income loss is estimated at JM\$47,882 million (US\$641 million) annually in Jamaica in the period 2006–2007.

NCDs not only adversely impact quality of life through morbidity or mortality, but also impose an economic burden on households and on society as a whole. For example, a 1999 study in Jamaica found that nearly 57 percent of persons diagnosed with cancer, diabetes, or a mental health illness had to forego treatment due to their inability to pay (Henry-Lee and Yearwood 1999). Understanding the economic implications of NCDs on individuals and on society is essential for policy-makers for the design of interventions for prevention and treatment.

Disparities in the economic burden of NCDs exist by age, gender, income group, insurance cover, and type of disease. An average individual suffering from NCDs spends approximately one-third of household per-capita expenditure on healthcare services and purchases of pharmaceuticals. National aggregate out-of-pocket health expenditure amounted to JMD33,813 million (US\$452 million), or 3.08 percent of Jamaica's GDP. The 2006 and 2007 annual average total economic burden of NCDs on individuals, including indirect income loss, is estimated at JMD47,882 million (US\$641 million). The poorest, the elderly, and persons with hypertension spent more on healthcare, indicating important targets for government intervention.

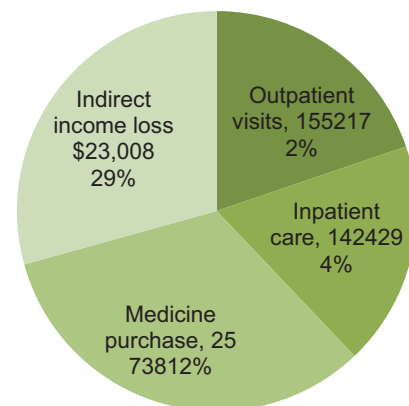
It should be noted that the estimates of the economic burden of NCDs in this chapter have several limitations. First, the data on health condition and medical expenditure are self-reported. Second, the estimates focus on a finite number of conditions listed in the survey, excluding other conditions such as cardiovascular disease. Third, although household per-capita expenditure is a good proxy for individual annual earning, the measure of income loss suffers from a lack of information on individual work status. Fourth, the measure of indirect economic burden does not include reductions in productivity, cost of years of life lost owing to premature mortality, and the value of activity days lost owing to disability or morbidity; nor are medical insurance premiums and preventive health-seeking activities included. Finally, the estimation of the economic burden was based on household expenditure and did not include the cost of provision for treatment and services.

ECONOMIC BURDEN OF NCDs AT INDIVIDUAL AND HOUSEHOLD LEVELS

The analysis in this chapter focuses on economic burden at the individual as well as the household level. The direct economic burden at individual level is the sum of out-of-pocket spending by NCD patients on outpatient visits, inpatient care, and medication. The indirect economic burden of NCDs is from loss of income owing to work absenteeism associated with illness¹⁵.

NCDs have resulted in an enormous direct and indirect economic burden for individuals in Jamaica. In 2006 and 2007, average annual individual direct out-of-pocket healthcare costs accounted for 71 percent of the total economic burden associated with NCDs (Figure 36), and on average amounted to JMD55,503 (US\$742) per person per year, or approximately one-third (36 percent) of annual household per-capita expenditure for NCD patients. Among three categories of direct out-of-pocket expenditure for healthcare, the most costly component is the purchase of medicines (33 percent of the average economic burden), followed by outpatient visits (20 percent), and inpatient care (18 percent). Another 29 percent of the economic burden of NCDs comes from indirect income loss of individuals resulting from work absenteeism, about JMD23,008 (US\$307.80) per person per year.

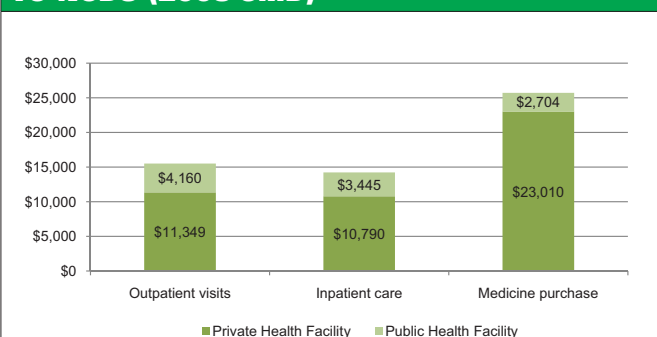
FIGURE 36. AVERAGE INDIVIDUAL ANNUAL ECONOMIC BURDEN OF NCDs IN JAMAICA 2006 AND 2007 (2008 CONSTANT JAMAICA DOLLARS)



Source: Studies estimates based on JSLC 2006, 2007

Patients spent much more at private facilities for outpatient visits, inpatient care, and the purchase of pharmaceuticals. As Figure 37 illustrates, NCD healthcare expenditure in private facilities for outpatient visits and inpatient care is threefold the expenditure in public facilities, and tenfold for medication purchases.

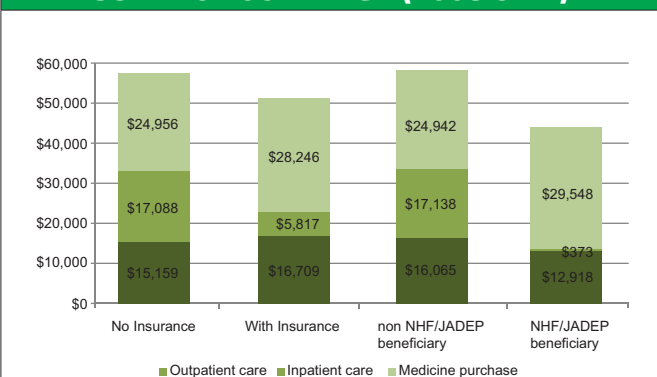
¹⁵ Indirect income loss is estimated as the number of days in a year that working patients are unable to carry out normal activities due to chronic conditions, multiplied by household total expenditure, and divided by the number of adults in the households (aged 18–59), as a proxy for individual adult annual earnings. Children and adolescents (0–17), and seniors (60 and older) are assumed not to be economically productive. All monetary values are annualized and adjusted to 2008 constant Jamaica dollars.

FIGURE 37. INDIVIDUAL ANNUAL DIRECT HEALTHCARE COST SPENT IN PUBLIC AND PRIVATE HEALTH FACILITIES ATTRIBUTABLE TO NCDs (2008 JMD)

Source: Studies estimates based on JSLC 2006, 2007

The presence of insurance cover is associated with only a limited reduction in out-of-pocket healthcare spending for NCDs. Only one-fourth of individuals with NCDs were covered by some type of medical insurance in 2006–2007. The impact of medical insurance cover on NCD out-of-pocket health expenditure is limited: individuals with insurance cover incurred a slightly smaller (JMD6,431 or US\$86.03 less) out-of-pocket healthcare expenditure per year than individuals without insurance coverage (Figure 38).

The cost of inpatient care showed the largest difference between insured and uninsured (JMD5,817 versus JMD17,088, or US\$77.82 versus US\$228.60), as insured spent three-fold less (Figure 38). Insurance does not appear to reduce out-of-pocket expenditure on prescription drugs or outpatient visits as insured patients actually spent slightly more for these two categories than the uninsured. This is probably because patients with insurance were more likely to use services. As a result, insured patients spent 11 percent less than people without health insurance on all three direct healthcare costs.

FIGURE 38. INDIVIDUAL ANNUAL DIRECT HEALTHCARE COST ATTRIBUTABLE TO NCD BY INSURANCE COVERAGE (2008 JMD)

Source: Studies estimates based on JSLC 2006, 2007

Beneficiaries of the two NHF programs spent significantly less than non-beneficiaries. About 17 percent of individuals with chronic conditions were enrolled in either the NHF Card or the JADEP program in 2006–2007. As shown in Figure 38, NHF or JADEP beneficiaries spent approximately the same amount out of pocket on outpatient visits and medication as non-beneficiaries. Non-beneficiaries incurred five times more for inpatient care than NHF/JADEP beneficiaries, however, resulting in considerably lower total healthcare costs for NHF/JADEP beneficiaries. The huge discrepancy in expenditure on inpatient care is largely explained by more non-beneficiaries using inpatient care service than beneficiaries (6 versus 2 percent). It is important to note that although NHF and JADEP beneficiaries did not have reduced expenditure on prescription drugs relative to non-beneficiaries, it is premature to conclude that the Program failed its intended policy impact. It is likely that patients use the savings from NHF/JADEP benefits on more frequent outpatient visits or inpatient care. Another possibility is that sicker people are more likely to participate in NHF/JADEP programs than healthier ones, spending more therefore on out-of-pocket health expenditure. A more rigorous research design is needed to evaluate the policy impact of the NHF and JADEP programs on people with chronic conditions.

Direct healthcare costs associated with NCDs were regressive and imposed a greater burden on poor households than on better-off households. The poor in general spent less on medical services owing to lack of access or medical insurance cover, inability to pay, or greater use of public services which charge less than private facilities. Their spending amounts to a larger proportion of household per-capita expenditure, however. During the period 2006–2007, the poorest quintile incurred mean direct costs of JMD23,742 (US\$317.62) and the richest quintile JMD11,2527 (US\$1508.38), but the proportion of per-capita expenditure was 40 percent for the poorest and 33 percent for the richest. This uneven distribution of direct out-of-pocket healthcare costs for NCDs in relation to economic status suggests the need for social protection policies that favor the poor.

Hypertension was the most costly chronic condition, followed by diabetes and arthritis, but indirect income loss was the largest for arthritis. Because total expenditures provide limited information about the drivers of the economic burden, we examine the expenditure pattern for five major chronic conditions by socio-demographic characteristics. Table 16 shows that nearly 37 percent of the total economic burden of four NCD conditions is attributable to hypertension (JMD86,700 or US\$1159.87). This cost is significantly higher than for the other three conditions. These high costs were largely a result of the elevated costs of hospitalization compared with other conditions. The second most costly category is diabetes, which incurred JMD42,939 (US\$574.52) direct healthcare costs and an indirect income loss of JMD13,000 (US\$173.91). Arthritis had a comparable level of direct healthcare cost to arthritis (JMD36,039 or US\$482.13) but had the highest cost from indirect income loss of the four conditions (JMD17,755 or US\$237.53). Medical insurance and enrollment in NHF or JADEP was most common in patients with diabetes, 40 percent and

32 percent respectively, and least common among persons with asthma. The economic burden of asthma was less than half that of hypertension patients, largely because such conditions did not lead to huge income loss from absenteeism and sick leave, and treatment cost for the condition was also relatively lower.

TABLE 16. ECONOMIC BURDEN OF FOUR MAJOR NCDs (2008 CONSTANT JMD)

	ASTHMA	DIABETES	HYPERTENSION	ARTHRITIS
Total economic cost	37,261	55,939	86,700	53,795
Direct out-of-pocket health-care cost (% of household per-capita expenditure)	31,911 (23%)	42,939 (28%)	69,890 (37%)	36,039 (23%)
Outpatient visits	9,321	12,698	15,281	11,7000
Inpatient care	1,272	3,027	29,928	0
Medicine purchase	21,317	27,213	24,680	24,339
Indirect income loss	5,350	13,000	16,810	17,755
Insurance Cover	22.76%	40.53%	28.19%	28.34%
NHF/JADEP Cover	2.76%	32.02%	26.65%	28.19%

Source: Studies estimates based on JSLC 2006, 2007

ESTIMATED NATIONAL AGGREGATED OUT-OF-POCKET EXPENDITURE ON NCDs

Population estimates¹⁶ show that females, the elderly (age 60+), and those in the richest quintile are more likely to suffer from NCDs (Table 17).

TABLE 17. ESTIMATED NCD PREVALENCE BY SOCIO-DEMOGRAPHIC CATEGORY

	PREVALENCE (%)	RELATIVE RISK	ESTIMATED POPULATION WITH CONDITION
BY GENDER			
Male	17.02		234,810
Female	25.28	1.48	365,627
BY AGE GROUP			
0–17	9.31		97,397
18–59	18.50	1.98	270,860
60+	66.41	7.13	228,581
BY POPULATION QUINTILE			
Poorest	17.18		97,098
Richest	26.74	1.55	151,130
BY FOUR MAJOR NCDs AMONG ENTIRE JAMAICA POPULATION			
Asthma	4.47		126,318
Diabetes	4.90	1.09	138,470
Hypertension	10.41	2.32	294,179
Arthritis	4.57	1.02	129,144

Source: Studies estimates based on JSLC 2008

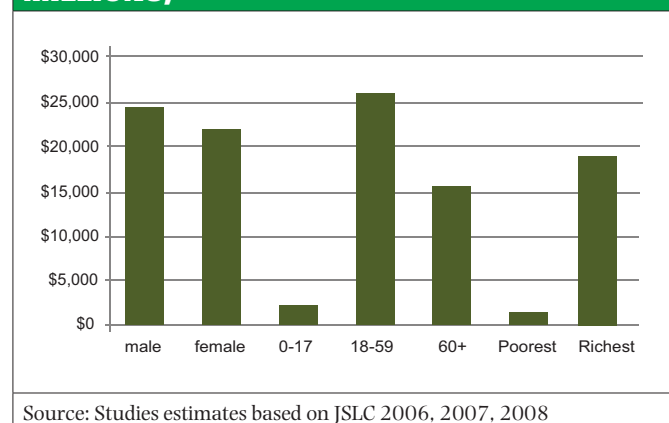
National aggregate out-of-pocket health expenditure amounted to JMD33,813 million (US\$452 million) per year during 2006 and 2007, 3.08 percent of Jamaica's annual GDP for that period (US\$14.6 billion). The share of out-of-pocket expenditure on NCDs to Jamaican GDP compares with other developing countries such as India, for example. In 2004, Indians spent nearly 3.3 percent of GDP on out-of-pocket healthcare expenses associated with NCDs (The World Bank 2010).

At the national level, the aggregate economic burden for females is comparable to that of males despite the fact that the prevalence of NCDs among females is significantly higher than among males. The 8 percent disparity in NCD prevalence between

¹⁶ Using the estimated total population of 2.826 million from the Central Intelligence Agency World Fact book for Jamaica in 2010 and reported NCDs from the JSLC 2007–8, while the number of people with NCDs was estimated by socio-demographic category.

females and males indicates that the female population is at higher risk from chronic conditions but females in general accrued far lower annual out-of-pocket healthcare expenditure (JMD44,791 or US\$599.21) and indirect income loss (JMD17,444 or US\$233.36) than males (JMD74,259 and JMD32,752, or US\$993.43 and US\$438.15) on a per-capita basis. As a result, the national aggregate economic burden for females amounted to JMD22,754 million (US\$304 million) per year, approximately the same level as for males at JMD25,127 million (US\$336 million) (Figure 39). There are no detailed data to allow more indepth analysis on why females are at higher risk from NCDs, but had lower out-of-pocket healthcare expenditure.

FIGURE 39. ESTIMATED NATIONAL AGGREGATE ECONOMIC BURDEN OF NCDs BY SOCIOECONOMIC GROUP (2008 JMD IN MILLIONS)



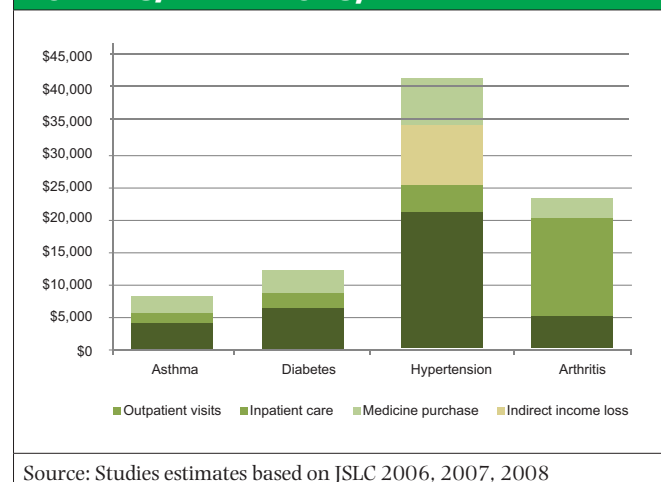
High NCD prevalence in the older (60+) population led to the largest direct healthcare burden in Jamaica, as would be expected. Out-of-pocket expenditure for the working population (aged 18–59) was moderate but indirect income loss resulting from absenteeism and sick leave was very large. The 60-and-over population accounted for only 38 percent of the incidence of NCDs but had the largest aggregate share (54 percent) of national direct healthcare expenditure for NCDs, or JMD17,577 million (US\$235 million) per year, which puts them at considerably higher financial risk than children and adults. The working age population (18–59) accounted for healthcare costs of JMD 11,340 million (US\$151 million), with indirect income loss of JMD 16,297 million (US\$218 million). Not surprisingly, healthcare expenditure for children and adolescents (0–17) was only one-fifth of the expenditure for the elderly, owing to considerably lower disease prevalence and lower medical treatment and medicine cost.

The richest quintile with NCDs spent almost seven times as much as the poorest on healthcare. Despite the 9 percent difference in NCD prevalence between richest and poorest, there is a sevenfold difference in healthcare expenditure: JMD17,006 million (US\$227 million) for the rich and JMD2,305 million (US\$31 million) for the poor group. The indirect income loss between these two economic subgroups is even larger owing to a stunning disparity in per-

capita household expenditure: income loss for the richest group was ninefold that of the poorest (JMD6,679 million versus JMD709 million or US\$89 million versus US\$9 million).

Hypertension caused considerably higher aggregate direct healthcare expenditure in all three cost categories, as well as higher indirect income loss, than any of the other three conditions. This represents 50 percent of the national economic burden of the four major NCDs. The primary cost driver for hypertension is its prevalence, more than twice that of any of the other three conditions. High per-capita medical costs also drive hypertension to such a high level. For persons with diabetes, over half of spending nationally is for prescription drugs; the remaining cost is for medical treatment and indirect income loss. Prescriptions also accounted for approximately 50 percent of the national aggregate economic burden for individuals with arthritis and asthma. Inpatient-care expenditure for arthritis patients was negligible.

FIGURE 40. ESTIMATED NATIONAL ECONOMIC BURDEN BY FIVE MAJOR NCD CONDITIONS, (2008 JAMAICA CONSTANT DOLLARS, IN MILLIONS)



This report has shown how the situation and trends of NCDs in Jamaica has impacted on the various groups in the country, how various policies and programs have responded to the challenge of dealing with NCDs and how these have impacted on the different groups faced with these diseases. This study has shown gaps where action is needed and the following chapter turns to a consideration of the experience of dealing with NCDs in other countries which could be applied to benefit Jamaicans burdened with NCDs.

8. LESSONS FROM OTHER COUNTRIES THAT ARE APPLICABLE TO TACKLING NCDs IN JAMAICA

In the process of developing Jamaica's national strategy to control the impact of NCDs, it could benefit from the experience of other countries. This chapter reviews these experiences which could be profitably applied in Jamaica.

Key Messages

1. Jamaica is developing a national strategy to control the impact of NCDs and could benefit from the experience of other countries.
2. Population-based primary prevention and early detection programs are the most cost-effective way to tackle NCDs.
3. Managing NCDs may require redefining and redistributing responsibilities across health professionals. Nurses can take on greater responsibilities. Using primary care teams and community-based programs are practical solutions for strengthening the capacity to address NCDs.
4. Disease management programs (DMPs) have developed in the past decade to manage individual NCDs, changing traditional approaches for treating NCDs. DMPs focus on controlling multiple risk factors of a disease rather than a single risk factor.
5. Integrated care models treat NCDs more effectively than dealing with a single disease. NCDs can rarely be treated in isolation. Patients often have several chronic diseases or conditions and may need care from different providers. Treatment and prevention of these conditions are better integrated across the whole range of care and services.

A literature review of the experience of other countries in tackling NCDs identified four intervention strategies (Reinhard Busse 2010), which are reviewed below, namely:

1. Emphasize prevention and early detection of chronic diseases
2. Adjust the qualifications and tasks of providers of care and redefine their functions
3. Coordinate disease management to replace episodic care
4. Recognize that patients may have multiple conditions that require integrated care in managing them rather than manage single diseases.

Strategy 1: Disease prevention and early detection

Primary prevention is directed at the prevention of illnesses by removing the causes. The target group for primary prevention is those that are healthy with respect to the target disease. Population-based interventions cover the whole population and intend to prevent the adverse health event from occurring. Programs would promote lifestyle changes to reduce obesity, smoking, and excessive alcohol consumption, to promote physical activity and to reduce other related risk factors that contribute to NCDs. Here are a few examples:

1. The National Health Service (NHS) in the United Kingdom (UK) launched the Change4Life program in January 2009 under the slogan “Eat Well, Move More, Live Longer” (UK Department of Health n.d.). The campaign targets families and adults utilizing strategic placement of advertising on TV, internet, posters, and buses. Change4Life features tools and ideas to motivate people to manage their weight such as “5 A Day”, “60 active minutes”, “me-size meals”, “cut back on fat” and “sugar swaps” (NHS Choices n.d.).
2. Mexico approved the “Children Obesity Law” in 2010, which is the first countrywide primary prevention program for obesity that encourages exercise, drinking more water and consuming fruits and vegetables (Tuckman 2010). The campaign bans junk food such as soft drinks, sweetened juices, tamarind candy, and pork rinds in school stores and cafeterias. OECD estimates that primary prevention programs such as this one could prevent up to 47,000 deaths from chronic diseases each year in Mexico.
3. The Tula province in the Russian Federation experimented with primary healthcare level prevention and management of NCDs with the involvement of multidisciplinary health teams. The project supported multidisciplinary teams in five healthcare facilities who were involved in planning the project. The objective initially was to promote healthy behavior in order to prevent complications from high blood pressure (HBP); to change the delivery of care for HBP according to new guidelines; to develop evidence-based guidelines for HBP care at the primary care level; and to reallocate financial and human resources to facilitate implementation of these services. The project produced positive results including a 70 percent success rate in

controlling HBP, an 85 percent reduction in hospital admissions for HBP, and net savings for overall HBP care costs (WHO n.d.).

Strategy 2: New provider qualifications

Nurses are taking on greater responsibilities and playing a key role in addressing NCDs, as countries begin to redefine and redistribute responsibilities across health professionals. A new profession of nurse practitioner has been established in the United Kingdom, the Netherlands, the United States, Canada, Australia, and New Zealand (Busse R 2007) (CHSRP 2006). These university-trained professionals carry out traditional nursing duties, but also assume responsibility for tasks that would traditionally be viewed as part of a doctor’s remit, such as limited prescribing of pharmaceuticals and administering the less-complex treatments. Germany has recently created community nurses, similar to nurse practitioners in other countries. They make house visits and are responsible for basic primary care, supported by eHealth equipment. This gives chronically ill people in rural regions better access to basic medical care. It also relieves family doctors for other work (Busse R 2007). Another new professional group is liaison nurses, introduced in several European countries. These carry out follow-ups after discharge, pulmonary rehabilitation for people with COPD, supervision of medication and compliance, patient education, and service navigation. The redistribution of responsibilities across the nursing profession (nurse practitioners, community nurses, liaison nurses) would need to be assessed within the current reality in Jamaica and the Caribbean as a whole where the shortage of highly trained nurses reduces the capacity of countries to meet their key health care service needs, especially in the areas of disease prevention and care.

Case managers are an option to complement the work of physicians and nurses to provide care related to NCD patients. Case managers coordinate services for people with long-term conditions or with complex social and medical needs. Their functions include assessing people’s needs, developing care plans, helping people access appropriate care, monitoring the quality of this care, and maintaining contact with the person and her/his family (Wilkins VM 2009). The central role of family caregivers in monitoring, treating, and managing chronic diseases and conditions is also increasingly being acknowledged (Wilkins VM 2009).

Innovative approaches such as the use of primary care teams and community-based intervention programs can provide a practical solution for addressing NCDs. Experiments with primary care teams for NCD patients have led to the reorganization of practices and creation of patient-centered “care teams” that are capable of anticipating patients’ needs and facilitating communication about their care. In a pilot practice with patients with hypertension in the state of Maine in the United States, the percentage of patients with controlled hypertension rose from 55 percent in July 2007 to more than 82 percent in July 2010 (Feder 2011). “Crusade for the quality of health services” is a project launched by the Secretariat of Health of Mexico in the state of Veracruz to provide better healthcare to

people with chronic diseases. A one-year pilot project conducted in-service training of primary-care personnel to adopt a quality improvement methodology and also implemented a structured diabetes education program. Among innovations introduced at the primary-care level were the organization of diabetes clinics, collective medical visits for self-support groups of people with diabetes, and training people with diabetes to be community health workers. The pilot evaluation identified an 11-percent increase in cases of diabetes that were under good control (28 to 39 percent) in the intervention group, while among those receiving the usual care the proportion only increased from 21 to 28 percent. In the treatment group, the proportion of patients using insulin increased from 3.5 to 7.1 percent, while it remained at 0.9 percent among those receiving traditional care (WHO n.d.).

Community-based rehabilitation programs have been organized in Pakistan and India. Multidisciplinary and intensive rehabilitation programs proved effective in reducing stroke, chronic pain, and impaired functioning after myocardial infarction as major causes of disability, including blindness, lower limb amputation, and motor and sensory dysfunction. The community-based rehabilitation program in rural south India supported permanently blind people through mobility training as well as training to perform normal daily activities. The program improved quality of life for some 95 percent of participants. In Pakistan, the program trained volunteer local supervisors from targeted communities (villages and slum areas) to identify and train people with disabilities to perform their routine daily activities. One to two years after training, 80 percent of participants showed improvement in function (WHO n.d.).

Strategy 3: Disease Management Programs for Individual NCDs

Disease management programs (DMPs) have developed in the past decade that are changing traditional ways of managing NCDs. The standard approach to NCD management is to treat symptoms: diagnose and prescribe a treatment. Medical practitioners have come to realize that the underlying causes of the presenting symptoms are multiple and that effective treatment requires attention to the root causes of a specific disease. DMPs focus on controlling multiple risk factors rather than on a single one. Patients often have several risk factors present and need medical attention, treatment, and follow-up to prevent an existing condition from deteriorating into an incapacitating or fatal result. Diabetes is a leading NCD in Jamaica. The daily injection of insulin for diabetic patients must be complemented by other disease management efforts such as physical activity and appropriate diet. This comprehensive and multidisciplinary approach to caring for an entire disease cycle also includes active patient management tools such as health education, empowerment, and self-care (Velasco-Garrido M 2003).

Main features of DMPs include the following:

- Comprehensive care that is multiprofessional and multidisciplinary
- Integrated care, care continuum, and coordination of care components

- Patient management tools e.g. health education, empowerment, and self-care
- Use of evidence-based guidelines, clinical protocols, and care pathways
- Information technology
- Continuous quality improvement

A number of developed countries are experimenting with DMPs. Experiences from developing countries are limited. The Centers for Medicare and Medicaid Services in the US have conducted seven DMPs involving 300,000 beneficiaries in 35 programs (Bott, et al. 2009). Patients with chronic conditions such as heart failure, diabetes, and chronic obstructive pulmonary disease appeared to be motivated and able to engage in improved self-management with the result that chronic conditions could be avoided by better day-to-day self-management. High costs associated with chronic conditions stem from emergency department visits and from inpatient hospital admissions that could be reduced with coordinated and comprehensive disease management. Germany has implemented a nationwide disease management program that is based on primary care and sustained physician involvement for patients with diabetes mellitus that is currently accessible to around 90 percent of the population (Stock, et al. 2010). The program is based in primary-care practices and carried out by physicians, and draws on personal relationships with patients to promote adherence to treatment goals and self-management. After four years of follow-up, overall mortality for patients and drug and hospital costs were all significantly lower for patients who participated in the program than for other insured patients with similar health profiles that were not in the program. These results suggest that the German disease management program is a successful strategy for improving chronic illness care.

A developing country example comes from China where in 1999–2001 the city of Shanghai developed a chronic-disease self-management program. It was implemented in thirteen communities and six districts and conducted by trained volunteer leaders. The disease-management methods included exercise, the use of cognitive symptom-management techniques, proper nutrition, fatigue and sleep management, use of medications, management of fear, anger, and depression, communication with health professionals, and problem-solving and decision-making techniques. After six months, the disease self-management program significantly improved participants' health behavior, confidence, and health status, reducing the number of hospitalizations.

Jamaica needs to move from episodic care based on prescribing medications to managing NCDs comprehensively. Comprehensive care programs would control the early stages of a disease condition and prevent its progression through primary prevention before problems arise, such as the Change4Life program in the UK, and secondary prevention to detect potential cases of being overweight and obesity early, such as in the National Child Measurement Program in the UK that measures children's height and weight and in which 91 percent of English school children participate. The continuum of care would cover prevention and treatment at

home, in work places, in schools, in ambulatory settings, and at the inpatient level.

Strategy 4: Case Management – Comprehensive Integrated Care Models

Integrated care models treat NCDs more effectively than focusing on a single disease. Doctors and researchers admit that they have focused on a straightforward disease-management approach because it was relatively simple. Chronic conditions do not present alone, however, and NCDs can rarely be treated in isolation. Patients often have several chronic diseases or conditions at a time and need care from different providers. These models organize prevention and treatment in such a way that services are better integrated across the whole range of care. Examples of this are the introduction of case management by the NHS in the United Kingdom, and pilot projects in Spain in which the whole care process is provided from only one source. Many developed countries have set up various forms of provider networks and interventions to close the gap between primary care and hospital services. Some countries are experimenting with new models of healthcare delivery through comprehensive integrated care models or provider networks that can achieve more integrated and more comprehensive services.

Recent experience in developed countries shows that some are moving towards integrated care models. Integrated care models developed in the United States have been adopted in Europe. The redesign of healthcare services has been guided by approaches taken by the health maintenance organization Kaiser Permanente in the United States; these have been used as the basis for NHS programs since 2003 in the United Kingdom. The 2004 NHS Improvement Plan stipulated the introduction of case management in all Primary Care Trusts by appointing senior nurses by 2007. In Germany, DMPs promote integrated care models based on the family physician as gatekeeper, integrated care contracts, and medical polyclinics. France introduced mechanisms aimed at stimulating local provider networks for ambulatory patients and at improving the interface between ambulatory and hospital care under the heading of health networks (*réseaux de santé*). These arrangements now include mobile dialysis units, specialized mental healthcare facilities, new cancer centers (combining research, treatment, and prevention) and new centers for managing HIV/AIDS. The Canadian province of Ontario promotes networks of family doctors – family health groups and family health networks – and local health integration networks. The mission of these local care networks is to improve the planning, coordination, and integration of healthcare. Being local organizations, they are expected to be more responsive to local needs.

The review of other countries' experiences in dealing with the challenge of NCDs may be useful for policy-makers in considering the approaches and programs that can be initiated in Jamaica. The following chapter makes recommendations in regard to the policy options which the country faces.

9. POLICY OPTIONS

The preliminary analysis of Jamaica's NCD policy and programs indicates that the drug subsidy program supported by the NHF has helped NCD patients reduce their spending on treatment. There is little evidence indicating that the trend of NCDs is likely to increase and much more needs to be done to stop and reverse the increasing trend. Prevention programs supported by the NHF may not have produced results in reducing the population's exposure to key risk factors as the emphasis has been on treatment. The following are policy options and interventions that Jamaica may consider for enhancing its NCD prevention and control programs, with priorities for strengthening the national response.

Policy options include prevention actions at primary, secondary, and tertiary levels. Primary prevention aims to prevent exposure to the risk factors that cause disease. These may include policies that are anti-smoking, encourage physical activity, promote a healthy diet, and reduce harmful use of alcohol. Secondary prevention strategies attempt to diagnose and treat an existing disease in its early stages before it results in significant morbidity. Policy options to be considered at the secondary level of care include adopting new care models such as DMPs and integrated care models, strengthening the surveillance on NCDs, and using information and communications technology such as electronic patient records and clinical decision support systems. Tertiary prevention aims to reduce the negative impact of an established disease by restoring function and reducing disease-related complications. Activities at this level would focus on the avoidance of complications and preventing disease progression.

Priorities to Strengthen the National Response to NCDs

Improve efficiency of the NHF by: (1) assessing the effectiveness of prevention programs financed by the NHF; (2) striking the appropriate balance between prevention and drug-subsidy programs; and (3) improve targeting of the poor under the drug-subsidy programs. Activities could focus on geographic areas where poverty, disease, and violence are concentrated, and where the poor population should be provided with NHF cover.

Improve the financial sustainability of the NHF. Government budgets and the NHF are the primary sources of financing for NCD prevention and treatment. Increasing financing for NCD prevention and treatment is a challenge due to: (i) the impact of the global financial crisis; (ii) the increase in the patient enrollment rate (16 percent increase in 2008–09); and (iii) the MOHE request to expand the program and add new drugs to the list of benefits. The NHF is facing budget problems and without additional financing the program may “collapse in the near future”, according to NHF management. Implementing a more comprehensive NCD strategy will require more funds. The Ministry of Finance is aware of this and has promised to increase financing using the newly introduced gas tax and setting a new threshold for the National Insurance Scheme. The NHF is a well-organized entity. The primary mitigation measure when facing a serious financial difficulty would be to cut the number of institutional projects financed but not the number of enrollees (The Gleaner 2009). It may be possible to finance the NHF out of general taxation or linking its financing to payroll taxes. These measures would make the fund more sustainable and able to meet the increasing needs for prevention and treatment. Other methods for mobilizing resources could be expanding public-private partnerships.

Build a comprehensive National Strategy for NCDs. The determinants of NCDs are entrenched in behavior and social conditions and require a comprehensive, multilevel, and multisector strategy. Reversing the NCD epidemic in Jamaica requires a National Strategy that combines the three levels of prevention. The focus so far has been on clinical interventions mainly to

subsidize medications (prescribing) and much less on population-based primary prevention. The National Strategy will need to put population-based prevention at center stage and define achievable and measureable goals with specified time frames.

Improve the surveillance system to monitor the risk factors and NCDs. A dearth of reliable registration and reporting of cause-specific mortality and morbidity makes targeting difficult. Improving the information on risk factors is a necessary first step for feeding data into the NCD policy dialogue. Health Information systems need to be developed to collect and report data on risk factors, mortality, morbidity, and the determinants of NCDs.

Reduce the risk factors through policy interventions. Legislation and regulations are needed to control tobacco and alcohol production and use, and to reduce trans-fat and salt intake by working with manufacturers and the food-production industry to ensure healthy food supply.

Address the gender dimension when targeting. Women and men are exposed to risk factors to a different degree. Men are more likely to use tobacco and consume alcohol in excess while women are more likely to be obese and physically inactive. Health-promotion programs need to target gender-specific risk factors using tested methodologies.

Evaluate the effectiveness of policies, strategies and interventions, refine targeting groups, and accelerate, adjust, or change interventions as necessary, learning from results on the ground.

Reorient the health-services delivery system with its physical, human, and financial resources to adopt new care models. Learn how other countries use DMPs and integrated care models that hold the promise of more effective approaches to improve health outcomes for NCD patients, as well as potentially contain costs and increase patient satisfaction.

Adopt a multisector approach to NCD prevention and control by involving non-health ministries, civil society organizations and the private sector. Jamaica has a wealth of experience in controlling the HIV/AIDS epidemic and such knowledge can be used for NCD prevention and control. Civil Society Organizations and the private sector can play critical roles in preventing unhealthy diet, encouraging physical activity, and discouraging tobacco use and excessive use of alcohol. The business community can contribute to both financing and implementation of NCD prevention.

This report has attempted to contribute to the body of knowledge on the situation regarding NCDs in Jamaica. It has considered the trends, impacts, and costs associated with NCDs, examined the policies undertaken to deal with them together with their results, and referred to lessons from other countries. It is hoped that policy-makers in Jamaica will be able to benefit from this information to generate and apply policies that will improve the NCD situation in the country and that other countries will also benefit from the information and conclusions arising out of this study.

ANNEX A: TIME-TREND ANALYSIS METHODOLOGY

To understand disparities in health outcome and health-related expenditure in Jamaica, we conducted time-trend analysis across socioeconomic groups over time. Our goal was to examine whether population differences in time trend are primarily associated with individual and household socioeconomic and demographic characteristics.

We employed data from the Jamaica Survey of Living Conditions (JSLC)¹⁷, a cross-sectional face-to-face annual survey done since 1988. This national survey was implemented to establish baseline measures of household welfare and then to monitor the impact of Jamaica's Human Resource Development Program on health, education and nutrition. With the exceptions of 2003 and 2005¹⁸, the JSLC linked to the quarterly Labor Force Survey (LFS), and provided specific information on all six modules – demographic characteristics, household consumptions, health, education, housing, and social welfare and related programs. The JSLC randomly chose one-third of households on a circular systematic basis with a random start from the LFS, the sampling strategy of which is a two-stage stratified process designed to select approximately one-and-a-half percent of the dwellings in Jamaica. The LFS sample is self-weighted, that is, each household in Jamaica is equally likely to be included in the survey sample. The table below shows JSLC individual and household sample size for each interview year between 1990 and 2009, the primary data sources our time-trend analysis relied on. Among those years, 1992, 1998, 2002 and 2008 contained the largest sample with approximately 20,000 individuals interviewed.

Dependent Variables

To examine health outcome and expenditure time trend in recent decade, several dependent variables were selected for regression analysis, including individual-level chronic-illness status, and healthcare access, and household-level medicine expenditure, medical-service expenditure, alcohol consumption, and tobacco consumption. For individual-level analysis, the sample focused on adults aged 18 years and older, reflecting the fact that the adult population is at considerably higher risk of NCD than children and adolescents; while household-level analysis included all households in the JSLC sample unless otherwise specifically stated. Because of the nature of the JSLC survey, all information relied on respondents' recollection of past behavior in a given period, and was therefore subject to self-report biases. Underreporting was especially likely to occur in risky behavior questions owing to social desirability. Despite these limitations, data from the JSLC still provided a general picture of NCD and NCD-related outcome for entire population in Jamaica.

¹⁷ Publicly available at <http://salises.mona.uwi.edu/databank/JSLC.htm>. For detailed information, please refer to the JSLC annual report, a joint publication of the Planning Institute of Jamaica and the Statistical Institute of Jamaica

¹⁸ The 2003 and 2005 surveys did not ask individual health module questions

YEAR	INDIVIDUAL OBSERVATIONS	HOUSEHOLD OBSERVATIONS
1990	7,233	1,828
1991	7,197	1,786
1992	18,250	4,485
1993	7,317	1,963
1994	7,109	1,940
1995	7,535	1,976
1996	6,997	1,825
1997	7,282	2,020
1998	26,504	7,375
1999	6,554	1,876
2000	6,309	1,800
2001	5,713	1,668
2002	24,382	6,976
2003	6,720	2,037
2004	6,680	1,981
2005	6,299	1,997
2006	6,297	1,917
2007	6,611	1,994
2008	22,294	6,513
2009	6,108	1,787

Individual chronic illness dummy variable was derived based on self-report last-4-week illness status. Before 2008, each respondent was asked in the health module whether they had suffered from any illness in the reference period; this was then followed up with a question on the type of illness, which was the key information to identify chronic-illness status. The wording of the question varied across years, particularly before and after the year 2000¹⁹. In general, respondents who reported any illness in the reference period were assigned with chronic illness dummy value 1 if the illness had begun before the past 4 weeks or the illness was recurring or chronic, and value 0 otherwise. We acknowledged the inconsistency and inaccuracy of the survey questions in terms of chronic illness definitions. Nonlinear functional forms of time trend were therefore introduced to partly account for such issues, as explained in the regression methodology section. Instead of being restricted to respondents who reported illness in a very short period of time in the 1988–2007 survey years, the surveys in 2008 and 2009 made inquiries about current chronic illness status for each individual regardless of their past record or disease time frame. Because 2008 had a much larger sample than 2009, 2008 cross-sectional data were used to show national representative prevalence statistics on NCD; data before 2008 were utilized to perform time-trend regression analysis.

Healthcare access is a dummy variable indicating any visits to a doctor, nurse, pharmacist midwife, healer or any other health practitioner in the past 4 weeks. The sample being analyzed are all adult respondents suffering from illness in the reference period.

Two variables were generated to examine the trend of household medical expenditure in past 12 months. Household expenditure on medicine covered pills, tonics, drugs, family planning supplies, herbal medicines, mechanical contraceptive devices, condoms, IUDs, etc.; household medical-service expenditure consisted of doctors' fees, hospital care, prescriptions, spectacles, and laboratory fees. The wording of questions was quite consistent across years. Both expenditure data were divided by household size to obtain per-capita values. Regression samples comprised all households that reported at least one member suffering from illness in the past 4 weeks in order to explore time-trend differences in the household burden for NCD patients and non-NCD patients.

Tobacco and alcohol consumption are leading risk factors of NCD. Unfortunately, the JSLC did not provide risky behavior questions for individuals. We captured such information instead by using household per-capita tobacco and alcohol expenditure data, which were collected in daily expense and food expense modules. Monetary value of the last 7 days' purchase of tobacco products (cigars, cigarettes, chewing tobacco, pipes, etc.) and alcoholic beverages (rum, whiskey, wine, beer, sherry, etc.) were multiplied by 4.33*12 to achieve an annualized amount. Household per-capita expenditure was the total expenditure per household divided by the household size.

All monetary values in time-trend analysis were adjusted to 2008 Jamaica constant dollars using World Bank historical CIP data.

Independent Variables

To investigate the time trend by specific characteristics net of other demographic changes, we adjusted trends based on a regression model and weighted to correspond to the population in the 2008 study. Individual and household socioeconomic characteristics included in regression analysis when appropriate were: gender, age group, marital status, education categories, region of residence, household per-capita expenditure quintiles. Age was grouped into three categories (18–29, 30–59, 60+) to represent differences in risk/behavior among the younger adult, older adult, and senior population. Value 1 was assigned to households located in Kingston Metropolitan Area and other towns, and 0 to rural areas. Population consumption quintiles (quintile 1 being the poorest and quintile 5 being the wealthiest) were derived based on annual household per capita expenditure.

Time trend was specified as year and year squared to capture nonlinear changes over time. As a sensitivity test to this functional form, analysis using linear time trend, but allowing for different slopes before and after year 2000 was conducted to capture potential different magnitude of changes for the periods of 1990–

¹⁹ Surveys up to and including 1999: "did this illness begin within or before last 4 weeks?" 2000, 2001: "is this illness recurring?" From 2002, each type of selected chronic illness was probed, including diarrhea, asthma, diabetes, hypertension, arthritis, and others

1999 and 2000–2007. Interactions between time trend and key socioeconomic factors were captured by interactions between year and gender, year and education, year and region, year and household quintiles. These interactions examined changes of health outcome or expenditure among different subgroups. Gender (male=1, female=0) is a dummy variable, and year is calendar year, years is year quadratic. The two interactions terms between gender and time would therefore be gender with calendar year and gender with year square. If coefficients of both interactions terms after regression simultaneously equals to 0, this indicates that in each and every period, change of dependent variable was the same for male and female and no difference in time trend between genders. Empirical regressions showed that time functional forms did not affect general pattern of time trend for every outcome, the report thus only presented the results by year and year squared.

Besides common independent variables summarized above for individual-level outcomes, we also included several other variables in regression as the case required. For example, alcohol and tobacco consumption are suggested as the leading causes of NCD; we therefore added household expenditure data on these two types of risky behavior in NCD-prevalence regression. Another example is medical expenditure. To understand the differences in medical-expenditure time trend between NCD patients and non-NCD patients, we incorporated household-member disease type dummies in regression so that households with at least one NCD member and households with at least one non-NCD member could be compared with each other. Regression details were listed in table below.

Statistical Method

Ordinary least squares or binary choice probit regressions were performed depending on the outcome being analyzed. Joint tests of interaction terms were conducted for the null hypothesis that no differences in weight gain exist across socioeconomic groups. Statistical significance level was defined as $p < 0.05$.

We summarized adjusted time trend across years in following steps: (1) Regression results were obtained using full sample in all study periods. (2) Adjusted outcome for the year 2008 (reference year) were predicted based on regression results. (3) Predicted outcome in all other years were generated based on 2008 sample characteristics and full model coefficients except for the time value replaced with that particular year. For instance, to predict the conditional mean of NCD prevalence in the year 1999, all observations in 2008 were retained but year values were changed to 1999. (4) Average annual conditional mean of outcome was then plotted each year by socioeconomic subgroups. Regressions and summary statistics were all weighted to correct for inequality of non-response across enumeration districts so as to represent national population characteristics.

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	REGRESSION TECHNIQUE	STUDY PERIOD	SAMPLE
NCD status	Age, gender, education, region of residence, population quintile, household per-capita alcohol and tobacco consumption, marital status, year, year quadratic	Probit	1994–2007	Adults
Healthcare access	Age, gender, education, region of residence, illness type, health insurance coverage, population quintile, marital status, year, year quadratic	Probit	1994–2007	Adults who reported illness in last 4 weeks
Medicine expenditure	Region of residence, population quintile, household member illness type, household member health insurance coverage, household sanitation characteristics, year, year quadratic	OLS	1994–2007	Households with at least one member reporting illness in last 4 weeks
Medical service expenditure	Region of residence, population quintile, household member illness type, household member health insurance coverage, household sanitation characteristics, year, year quadratic	OLS	1994–2007	Households with at least one member reporting illness in last 4 weeks
Alcohol expenditure	Region of residence, population quintile, year, year quadratic	OLS	2000–2009	All households
Tobacco expenditure	Region of residence, population quintile, year, year quadratic	OLS	1994–2009	All households

ANNEX B: ECONOMIC BURDEN OF DISEASE METHODOLOGY

The objective of economic burden of chronic disease study is to estimate the direct healthcare cost attributable to chronic illness and the indirect cost attributable to productivity in Jamaica. Direct out-of-pocket healthcare costs include expenditure on outpatient visits, inpatient care, and purchase of medicines among chronic disease patients. Indirect costs are income loss associated with the disease. The analysis includes an assessment of the economic burden resulting from the four most prevalent, costly and disabling chronic conditions in Jamaica: asthma, diabetes, hypertension, and arthritis.

The cost estimates are derived from the Jamaica Survey of Living Conditions (JSLC) 2006 and 2007. We are concerned with the economic impact at the level of individuals. Owing to data restrictions, we limit our study sample to individuals who reported one of four chronic conditions: asthma, diabetes, hypertension, and arthritis. Total direct out-of-pocket healthcare costs for each patient are the sum of three components: outpatient visits, inpatient care, and purchase of medicines. The costs are further disaggregated into expenditure at private and public facilities to make possible a comparison between facility types. Indirect income loss for each patient is estimated as the number of days in a year that working patients are unable to carry out normal activities owing to chronic conditions, multiplied by household total expenditure then divided by the number of adults in the household aged 18–59, which proxies adult individual annual earnings. Income loss was estimated for working-age adults only (age 18–59). Children and adolescents (0–17), and seniors (60 and older) are assumed not productive. All monetary values are adjusted to 2008 constant Jamaican dollars using the consumer price index.

After computing direct healthcare out-of-pocket cost and indirect income loss due to chronic illness for each NCD patient, we report the average annual cost in 2006 and 2007 in the study population. To understand the economic burden among the entire Jamaica population, we also obtain an aggregate individual economic burden by multiplying the individual average cost by the total number of NCD patients (asthma, diabetes, hypertension, and arthritis) in Jamaica. NCD prevalence was estimated from JSLC 2007–8. The number of NCD patients in Jamaica is the product of NCD prevalence and the estimated total population of 2.826 million taken from the Central Intelligence Agency World Fact book for Jamaica in 2010.

It should be noted that the estimates of the economic burden of NCDs have several limitations. First, the health conditions and medical expenditure are self-reported data. Second, the estimates focus on a finite number of conditions listed in the survey; therefore, some other conditions such as cardiovascular disease were excluded. Third, although household per-capita expenditure is a good proxy for individual annual earning, income-loss measure is still subject to bias owing to lack of information on individual work status. Fourth, the measure of indirect economic burden does not include productivity reduction, cost of years of life lost owing to premature mortality, and the value of activity days lost owing to disability or morbidity. Medical insurance premiums

and preventive-health-seeking activities are not considered either and, finally, the estimation of the economic burden was based on household expenditure and did not include the cost of provision for treatment and services.

ANNEX C: THE JAMAICA SURVEY OF LIVING CONDITIONS

The Jamaica Survey of Living Conditions (JSLC) was first conducted in 1988. The JSLC was originally conceived to be a semi-annual survey. Early on the schedule was interrupted by Hurricane Gilbert and national elections. In 1990, an annual survey was deemed to be sufficient and an annual schedule was adopted. Twenty-two rounds of the survey were completed from 1988 to 2008: 1988, 1989-1, 1989-2, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, and 2009.

The nationwide survey was implemented to establish baseline measures of household welfare and then to monitor the impact of Jamaica's Human Resources Development Program on health, education and nutrition. The JSLC differs from other Living Standard and Measurement Surveys in its relatively narrow focus and greater emphasis on immediate policy impact. The JSLC is linked to the ongoing quarterly Labor Force Survey (LFS). The households are visited once for the standard LFS. Then a subset of households is revisited about a month later for the JSLC. When the data sets are merged, the LFS serves as the employment module of the combined LFS/JSLC. To avoid respondent fatigue, the JSLC household questionnaire is short enough to be administered in one interview (as compared to two interviews in the typical LSMS survey).

In general, each JSLC questionnaire has included modules on health, education, nutrition, consumption, and housing. On a rotating basis, designated topics have received additional emphasis. To date, expanded modules for Health, Poverty, Education, Housing, Consumption, Household Finances, Employment, Aging, and Coping Strategies have been carried out. The JSLC surveys contain no data on agricultural activities, non-agricultural household activities, or migration. Only the 1989-2 survey has a fertility module.

Data are publicly available at <http://salises.mona.uwi.edu/databank/JSLC.htm>.

REFERENCES

DominicaNewsOnline. University of the West Indies Open Campus Dominica. 2010 13-December . <http://dominicanewsonline.com/dno/third-annual-dr-bernard-a-sorhaindo-memorial-lecture-set-for-thursday/> (accessed May 15, 2011).

Abu-Raddad, L, F Akala, I Semini, G Riedner, D Wilson, and O Tawil. *Characterizing the HIV/AIDS Epidemic in the Middle East and North Africa: Time for Strategic Action*. Washington, DC: The World Bank, 2010.

Adeyi, O, O Smith, and S Robles. *Public Policy and the Challenge of Chronic Non-communicable Diseases: Directions in Development*. Washington DC: Human Development, World Bank, 2007.

Agency for Healthcare Research and Quality . *Preventing Disability in the Elderly With Chronic Disease*. n.d. <http://www.ahrq.gov/research/elderdis.htm> (accessed June 8, 2011).

Alberto, Barcelo, and Rajpathak Swapnil. "Incidence and prevalence of diabetes mellitus in the Americas." *ev Panam Salud Publica*, 2001: 300-308.

Alleyne, G. "The Silent Challenge of the Chronic Non-Communicable Diseases in the Caribbean." *Draft paper*, 2007.

Ammar, W. *Health System and Reform in Lebanon*. Cairo and Beirut: World Health Organization Regional Office for the Eastern Mediterranean and Entreprise Universitaire d'Etudes et de Publications, 2003.

Anderson, Gerard F., Hugh Waters, Patricia Pittman, Robert Herbert, Ed Chu, and Kristina Das. *Non-Communicable Chronic Diseases In Latin America and the Caribbean*. Baltimore, Maryland, USA: Bloomberg School of Public Health, Johns Hopkins University, 2009.

Assad, R., and F. Roudi-Fahimi. *Youth in the Middle East and North Africa: Demographic Opportunity or Challenge?* Cairo: Population Reference Bureau, 2007.

Barker, DJP. "Fetal Origins of Coronary Heart Disease." *British Medical Journal* 311 (1995): 171-174.

Barr, V. et all. "The Expanded Chronic Care Model: An Integration of Concepts and Strategies From Population Health Promotion to Chronic Care Model ." *Hospital Quarterly* 7, no. 1 (2003): 73-82.

Barrett, Raphael D., and Stanley Lalta. "Health Financing Innovations in the Caribbean:EHPO and the National Health Fund of Jamaica." *Inter-American Development Bank Sustainable Development Department Technical Papers Series*, November 2004.

- Baswell, Allen. "Smoking ban draws complains ." *Grenada Star* . 2009 13-January . <http://www.grenadastar.com/v2/content.aspx?module=ContentItem&ID=109859&MemberID=1218> (accessed 2011 18 -April).
- Bleich, S., Cutler, D., Adams, A., Lozano, R., Murray, C. "Impact of Insurance and Supply of Health Professionals on Coverage of Treatment for Hypertension in Mexico: Population Based Study." *BMJ*, October 27, 2007.
- Blum, K. "Nurse practitioners in eastern Germany. Health Policy Monitor." *University of Auckland, Centre for Health Services Research and Policy*. October 8, 2006. <http://www.hpm.org/survey/de/b8/3>.
- Boaden, R. "Evercare evaluation: Final report." National Primary Care Research and Development Centre, Manchester, 2006.
- Bodenheimer, T, E Wagner, and K Grumbach. "Improving primary care for patients with chronic illness: The chronic care model." *JAMA*, 2002: 1909–1914.
- Bonhauser, M., Fernandez, G., Püschel, K., Yañez, F., Montero, J., Thompson, B., Coronado, G. "Improving Physical Fitness and Emotional Well-Being in Adolescents of Low Socioeconomic Status in Chile: Results of a School-Based Controlled Trial." *Health Promotion International*, 2005: 113–122.
- Bott, David M., Mary C. Kapp, Lorraine B. Johnson, and Linda M. Magno. "Disease Management For Chronically Ill Beneficiaries In Traditional Medicare." *Health Affairs*, 2009: 86-98.
- Bryce, J, D Coitinho, I Darnton-Hill, D Pelletier, and P Pinstrup-Andersen. "Maternal and Child Undernutrition: Effective Action at National Level." *The Lancet*, 2008: 371:510-26.
- Busse R, Schlette S. "Health policy developments 7/8. Focus on prevention, health and aging, new health profession." *Gütersloh, Verlag Bertelsmann Stiftung*, 2007.
- Busse, R, and N Mays. "Paying for chronic disease care." In *Caring for people with chronic conditions: A health system perspective*, by McKee M Nolte E, 195–221. Maidenhead: Open University Press, 2008.
- Busse, R, M Blumel, D Scheller-Kreinsen, and A Zentner. *Tackling Chronic Disease in Europe: Strategies, Interventions and Challenges*. Observatory Studies Series, European Observatory on Health Systems and Policies, 2010.
- Butler, R. "Population aging and health." *British Medical Journal*, 1997: 1082-1084.
- "Caribbean360." *Plan to ban public smoking, tobacco ads in Jamaica Read more:* http://www.caribbean360.com/index.php/news/jamaica_news/464528.html#ixzz1QV9FpUgp. June 8, 2011.
- http://www.caribbean360.com/index.php/news/jamaica_news/464528.html#axzz1QV8OFFEi (accessed June 27, 2011).
- CDC. *Fact Sheet: Region of the Americas, Saint Lucia*. 2008 4-April . http://www.cdc.gov/tobacco/global/gyts/factsheets/amr/2001/saintlucia_factsheet.htm (accessed April 21, 2011).
- National Center for Chronic Disease Prevention and Health Promotion . n.d. <http://www.cdc.gov/excite/skincancer/mod13.htm> (accessed June 2011).
- Central Intelligence Agency. "CIA World Factbook." *the World Factbook*. n.d. <https://www.cia.gov/library/publications/the-world-factbook/> (accessed May 2011).
- Chobanian, AV. "The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report." *JAMA* 289 (2003): 2560–2572.
- CHSRP. "Development of nurse practitioners. Health Policy Monitor." *University of Auckland, Centre for Health Services Research and Policy*. October 8, 2006.
- Daar, Abdallah S. "Grand Challenges in Chronic Non-Communicable Diseases." *Nature*, November 2007.
- Daar, AS, PA Singer, and DL Persad. "Grand Challenges in Chronic Non-Communicable Diseases." *Nature* 450 (2007): 494-6.
- Danel, I, C Kurowski, and H Saxenian. *Brazil – Addressing the Challenge of Non Communicable Diseases*. Washington DC: World Bank, 2005.
- Dubois C-A, Singh D, Jiwani I. "The human resource challenge in chronic care." In *Caring for people with chronic conditions: A health system perspective*, by McKee M Nolte E, 143–171. Maidenhead: Open University Press, 2008.
- Durazo-Arvizu. "Rapid increase in obesity in Jamaica, compare to Nigeria and the United States." *BMC Public Health*, 2008: 8-13.
- EarthTrends Database, World Resources Institute* . n.d. <http://earthtrends.wri.org> (accessed 2011).
- "Economic and Social Survey, Jamaica." 2008.
- El-Zanaty, F, and A Way. *Egypt Demographic and Health Survey*. Cairo: Ministry of Health, 2008.

Ergo, A, M Shekar, and Gwatkin DR. *Inequalities in Malnutrition in Low- and Middle Income Countries: Updated and Expanded Estimates*. Washington, DC: The World Bank, 2008.

European Commission. *EURODIET Core Report – Nutrition & Diet for Healthy Lifestyles in Europe, Science & Policy Implications*. Crete: European Commission and University of Crete School of Medicine, 2000.

“EURODIET, Nutrition and Diet for Health Lifestyles in Europe, Science and Policy Implications, DG-SANCO.” 2004. http://ec.europa.eu/health/ph_determinants/life-style/nutrition/report01_en.pdf.

European Training Foundation. *Employment Policy Reforms in the Middle East and North Africa: Selected Issues on the Functioning of the Labor Market*. Luxembourg: ETF, 2006.

Evans, T, M Whitehead, F Diderichsen, A Bhuiya, and M Wirth. *Challenging inequalities in health: from ethics to action*. Oxford University Press, 2001.

FAO. “Antigua and Barbuda: Nutrition Country Profile.” United Nations, 2003.

FAO. *Dominica Country Summary Profile on Smoking Prevalence*. FAO, 2001.

FAO. “Dominica: Nutrition Country Profile.” 2003.

FAO. “Grenada: Country Summary Profile on Smoking Prevalence.” 2001.

“Nutrition country profile: Jamaica.” 2002. <ftp://ftp.fao.org/es/esn/nutrition/ncp/jammap.pdf> (accessed January 22, 2010).

FAO. “St. Vincent and Grenadines: Country Profile. Food security indicators.” 2002.

Feder, J. Lester. “At Martin’s Point In Maine, Primary Care Teams For Chronic Disease Patients.” *Health Affairs* 30, no. 3 (2011): 394-396.

Figuerola, J. “Health trends in Jamaica: significant progress and a vision for the 21st century.” *West Indian Medical Journal*, Sep 2001: 15-22.

Fogel, R. “Economic growth, population theory, and physiology: the bearing of long term processes on the making of economic policy.” *The American Economic Review*, 2004.

Fogelholm, M., and K. Kukkonen-Harjula. “Does physical activity prevent weight gain – a systematic review.” *Obesity Reviews*, 2000: 95-111.

Food and Agriculture Organization. *The State of Food Insecurity in the World: Economic Crises - Impacts and Lessons Learned*. Rome: United Nations, 2009.

Framework Convention Alliance. “Updated Status of the WHO FCTC as of October 29, 2010.” *Framework Convention Alliance*. n.d. http://www.fctc.org/images/stories/ratification_latest_Saint%20Vincent%20and%20Grenadines.pdf (accessed May 2, 2011).

Francis, Debbie. *Caribbean News Portal Caribarena Antigua*. 2009 10-January. <http://caribarena.com/antigua/health/diet-a-fitness/1436-obesity-in-children-on-the-rise-.html> (accessed April 12, 2011).

Gakidou, Emmanuela. “Management of diabetes and associated cardiovascular risk factors in seven countries: a comparison of data from national health examination surveys.” *Bulletin of the World Health Organization*, 2011: 172-183.

Gardner, Kim. *Overweight and Obesity in Five-Year-Old Children in Saint Lucia*. Community Child Health Service, Ministry of Health, Saint Lucia, Castries: Centre of Excellence for Children and Adolescents with Special Needs Memorial University of Newfoundland, Canada, 2009.

Glassman, Amanda, Thomas A Gaziano, César Patricio Bouillon Buendia, and Frederico C Guanais de Aguiar. “Confronting The Chronic Disease Burden in Latin America and Caribbean.” *Health Affairs*, 2010: 2142-2148.

Godinho, J. *Non-communicable Diseases in Latin America and the Caribbean Living Longer, Healthier lives*. Draft report, Washington DC: Latin America and the Caribbean Region, World Bank, 2006.

Gordon-Strachan, Geogriana. *Rapid Assessment of the Impact of the Economics Crisis on Health Spending in Jamaica*. Draft report, Washington DC: World Bank, 2010.

GoSL. “Government moves to ratify Framework Convention on Tobacco Control.” 2005 9-November. http://www.stlucia.gov.lc/pr2005/november/government_moves_to_ratify_framework_convention_on_tobacco_control.htm (accessed May 14, 2011).

Government of Jamaica Website. March 04, 2009. http://www.jis.gov.jm/health/html/20090303T180000-0500_18703_JIS_USER_FEES_MAJOR_IMPEDIMENT_TO_POOR_ACCESSING_HEALTH_CARE__SPENCER.asp (accessed June 15, 2010).

“Government of St. Lucia.” *OECS calls for protection of its pharmaceutical market from counterfeit Drugs*. 2004 2-November. http://www.stlucia.gov.lc/pr2004/november/oecs_calls_for_protection_of_its_pharmaceutical_market_from_counterfeit_drugs.htm (accessed 2 May 15, 2011).

- Green, Tarnia. *Dominica News Online*. 2011 30-March. <http://dominicanewsonline.com/dno/diabetes-and-hypertension-leading-causes-of-death-in-dominica/> (accessed April 12, 2011).
- Grenada Nutrition Country Profile. FAO, 2003.
- Gwatkin, DR, S Rutsten, K Johnson, E Suliman, A Wagstaff, and A Amouzou. *Socio-Economic Differences in health, nutrition and population within developing countries: an overview*. Washington, DC: The World Bank, 2007.
- Ham, C. "The Ten Characteristics of High Performing Chronic Care System." *Health Economics, Policy and Law* 5 (2010): 71-90.
- Hanson, Kara, and Peter Berman. "Private Health Care Provision in Developing Countries: A preliminary analysis of levels and composition." n.d. <http://www.hsph.harvard.edu/ihsg/publications/pdf/No-76.PDF> (accessed 2010).
- Henry-Lee, A, and A Yearwood. *Protecting the poor and the medically indigent under health insurance*. Partners for Health Sector Reform, IDB, 1999.
- Hensley, Daniel. *A Plan of Action for Localising and Achieving the Millennium Development Goals (MDGs)*. Castries, St. Lucia: OECS Secretariat, 2006.
- Hogan, Margaret C., et al. "Maternal Mortality for 181 Countries 1980-2008: a Systematic Analysis of Progress towards Millennium Development Goal 5." *The Lancet*, 2010: Published online April 12, 2010 www.thelancet.com.
- Horton, R. "Chronic Diseases: the Case for Urgent Global Action." *Lancet* 370 (2007): 1881-2.
- Horton, S, and J Ross. "The Economics of Iron Deficiency." *Food Policy*, 2003: 28:517-5.
- Hyder, A. *Road Traffic Injuries in the Middle East and North Africa: A Regional Assessment*. Unpublished report commissioned by the World Bank, 2009.
- Ichinohe, M. "The prevalence of obesity and its relationship with lifestyle factors in Jamaica." *The Tohoku Journal of Experimental Medicine*, 2005: 21-32.
- International Development Research Centre. n.d. http://www.crdi.ca/uploads/user-S/11577246161tobacco_jamaica_eng.pdf (accessed January 22, 2010).
- International Diabetes Federation. n.d. www.earlas.idf.org (accessed October 12, 2009).
- IDF DIABETES ATLAS. n.d. <http://www.diabetesatlas.org/> (accessed May 2011).
- Ivey, MA, G Legall, EV Boisson, and A Hinds. "Mortality trends and potential years of life lost in the English and Dutch-speaking Caribbean, 1985-2000." *West Indian Med.J*, Mar 2008.
- Jamaica National Council on Drug Abuse. 2004.
- Jamison, D, and A Bremen. *Disease Control Priorities in Developing Countries, Second Edition*. Oxford: Oxford Press, 2006.
- Jenkins, C, and DA Robalino. *HIV in the Middle East and North Africa: The Cost of Inaction*. Orientations in Development Series, Washington, DC: The World Bank, 2003.
- Kosteniuk, J, and D H Dickinson. "Tracing the social gradient in the health of Canadians: primary and secondary determinants." *Social Science and Medicine*, 2003: 263-276.
- Laith, JA, FA Akala, I Semini, G Riedner, D Wilson, and O Tawil. *Characterizing HIV/AIDS Epidemic in the Middle East and North Africa Region: A Time for Strategic Action*. Washington, DC: The World Bank, 2010.
- Lancet. *Lancet*. April 6, 2011. www.thelancet.com (accessed April 2011).
- Leatherman S, Berwick D, Iles D. "The business case for quality: Case studies and an analysis." *Health Affairs*, 2003, 22 ed.: 17-30.
- Leatherman, S. "Applying Performance Indicators to Health System Improvement." In *Measuring Up - Improving Health System Performance in OECD Countries*. Paris: OECD Publishing, 2002.
- Lieberman, SS, and A Wagstaff. *Health Financing and Delivery in Vietnam: Looking Forward*. Washington, DC: The World Bank, 2009.
- Luke, A. "Activity, Adiposity and Weight Change in Jamaican Adults." *West Indian Medical Journal*, 2007: 398.
- Lurie, N, and J McLaughlin. "In pursuit of the social determinants of health: the evolution of health service research." *Health Services Research*, 2003: 1641-3.
- Madrigal, Lorena. "Human Biology of Afro-Caribbean Populations." *Cambridge University Press*, 2006: 44-45.
- Maternal and Child Undernutrition Study Group. "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." *Lancet*, 2008: 243-60.
- Mathers, C, A Lopez, and C Murray. "The Burden of Disease and Mortality by Condition: Data Methods and Results for 2001." In *Global Burden of Disease and Risk Factors*, by AD Lopez, M Ezzati, JT Jamison and C Murray, 47-95. New York: Oxford University Press, 2006.

Mathers, CD, and D Loncar. "Projections of Global Mortality and Burden of Diseases from 2002 to 2030." *PLoS Med*, 2006: e442.

Micronutrient Initiative. "Investing in the Future: A united call to action on vitamin and mineral deficiencies, Global Report 2009." Ottawa, 2009.

Ministry of Health Jamaica. *Annual Report 2007*. Jamaica Ministry of Health, 2009.

Ministry of Health Jamaica. "Health Sector Performance Improvement Programme." 2002.

MOH. *National Business Plan for Health 2008-2010*. July 7, 2011. http://www.healthresearchweb.org/files/National_Health_Policies-Antigua_Barbuda-Business_Plan_Health_2008-10.pdf (accessed May 15, 2011).

MOHE, St. Vincent and Grenadines. "St. Vincent and Grenadines Strategic Plan for Health 2007-2012." 2007.

Monteiro, C, EC Moura, LC Wolney, and BM and Popkin. "Socioeconomic status and obesity in adult populations of developing countries: a review." *Bulletin of the World Health Organization*, 2004.

Mufti, MH. *Healthcare Development Strategies in Saudi Arabia*. New York: Kluwer Academic/Plenum, 2000.

Nassar, H, and S El-Saharty. "Chapter 5: Egypt." In *Global Marketplace for Private Health Insurance - Strength in Numbers*, edited by A Preker, P Zweifel and OP Schellenken, 163-188. Washington, DC: The World Bank, 2010.

NHE. 2008 *Annual Report*. National Health Fund, Jamaica Ministry of Health and Environment, 2008.

NHE. 2009 *Annual Report*. National Health Fund, Jamaica Ministry of Health and Environment, 2009.

NHS Choices. n.d. <http://www.nhs.uk/change4life/Pages/change-for-life-families.aspx> (accessed June 2011).

Nolte, E, and CM McKee. "Measuring the Health of Nations: Updating an Earlier Analysis." *Health Affairs* 27 (2008): 58-71.

Nolte, E, and M McKee. "Integration and chronic care: A review." In *Caring for people with chronic conditions: A health system perspective*, by McKee M Nolte E, 64-91. Maidenhead: Open University Press, 2008.

Novotny, TE. "Preventing chronic disease: Everybody's business." In *Caring for people with chronic conditions: A health system perspective*, by McKee M Nolte E, 92-115. Maidenhead: Open University Press, 2008.

Obegunde, DO, CD Mathers, T Adam, M Ortegón, and K Strong. "The Burden and Costs of Chronic Diseases in Low-income and Middle-income Countries." *Lancet* 370 (2007): 1929-38.

Observer, Antigua. OBSERVER News. February 9, 2011. <http://www.antiguaobserver.com/?p=54200> (accessed April 12, 2011).

OECD. *The Prevention of Lifestyle-related Chronic Diseases: An Economic Framework*. OECD Working Papers, DELS/HEA/WD/HWP(2008)2, Paris: OECD, 2008.

PAHO. *Country health profile*. 2001. <http://www.paho.org/English/sha/prfljam.htm> (accessed July 20, 2010).

"Epidemiological Bulletin." *The Global Youth Tobacco Use Survey: Status of Implementation in LAC countries*. June 2001. http://www.paho.org/english/sha/be_v22n2-GYTS.htm.

"Epidemiological Bulletin." June 2001. http://www.paho.org/english/sha/be_v22n2-cover.htm (accessed April 15, 2011).

PAHO. "Health in the Ameircas: Grenada country profile ." 2007.

PAHO. "Health in the Americas ." Volume II, World Health Organization , Washington DC, 2002.

PAHO. *Health in the Americas*. PAHO Scientific Publication, 2007.

PAHO/CARICOM. "Report of the Caribbean Commission on Health and Development." 2006.

PAHO/WHO. *Essential Public Health Functions as a Strategy for Improving Overall Health Systems Performance*. n.d. http://www.who.int/pmnch/topics/health_systems/paho_who_ephf2007/en/index.html (accessed June 3, 2011).

Pan America Health Organization. *Health in the Americas 2007*. Washington, DC: Pan American Sanitary Bureau, Regional Office of the World Health Organization, 2007.

Peden, M, R Scurfield, D Sleet, D Mohan, A Hyder, and E Jarawan. *World Report on Road Traffic Injury Prevention*. Geneva: World Health Organization, 2004.

PIOJ. Revised National Population Policy. United Kingdom: PIOJ, 1995.

Planning Institute of Jamaica . "Vision 2030: National Development Plan, Planning for a Secure and Prosperous Future." Kingston, 2009.

Planning Institute of Jamaica. *the Economic and Social Survey of Jamaica (ESSJ)*. Jamaica: Planning Institute of Jamaica, 2008.

Population projections Jamaica 2000-2050. STATIN, Kingston: STATIN, 2008.

Rajaratnam, JK, et al. "Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970-2010: a systematic analysis of progress towards Millennium Development Goal 4." *The Lancet*, 2010: Published online May 24, 2010 DOI:10.1016/S0140-6736(10)60703-9.

Reinhard Busse, Miriam Blümel, David Scheller-Kreinsen, and Annette Zentner. "Strategies against chronic disease: what is being done?" Chap. 4 in *Tackling chronic disease in Europe - Strategies, interventions and challenges*, by Miriam Blümel, David Scheller-Kreinsen, and Annette Zentner Health Reinhard Busse. World Health Organization, 2010.

Rocco, L. *Chronic Diseases and Labor Market Outcomes in Egypt*. Amman, Jordan: unpublished report, presented at the Middle East and North Africa Forum Conference, June 7-8, 2010, 2010.

Rothman, A, and E Wagner. "Chronic Illness Management: What is the Role of Primary Care?" *Annual Internal Medicine* 138, no. 38 (2003): 256-61.

Rothman, AA, and EH Wagner. "Chronic illness management: what is the role of primary care?" *Annual Internal Medicine*, 2003: 256-61.

Roudi-Fahimi, F, and MM Kent. "Challenges and Opportunities - The Population of the Middle East and North Africa." *Population Bulletin*, June 2007.

Samuels, Alafia. "Caribbean Wellness Day: mobilizing a region for chronic noncommunicable disease prevention and control." *Rev Panam Salud Publica* 28, no. 6 (2010): 472-279.

Sassi, F, and J Hurst. "The prevention of lifestyle related chronic diseases: an economic framework." *Working Paper, OECD*, 2008.

Smith, P, E Mossialos, I Papanicolas, and S Leatherman. *Performance Measurement for Health System Improvement: Experiences, Challenges and Prospects*. Cambridge: Cambridge University Press, 2009.

Solar, A, and A Irwin. "A conceptual framework for action on the social determinants of health." *Commission on Social Determinants of Health*, WHO, 2007.

"St. Kitts and Nevis Drug Information Network Annual Report ." 2003.

Stock, Stephanie, et al. "German Diabetes Management Programs Improve Quality Of Care And Curb Costs." *Health Affairs*, 2010: 2197-2205.

Strachan, G. "Rapid Assessment of the Impact of the Economic Crisis on Health Spending in Jamaica." Draft , World Bank, 2010.

Stromberg A, Martensson J, Fridlund B. "Nurse-led heart failure clinics improve survival and self-care behavior in patients with heart failure: Results from a prospective, randomized trial." *European Heart Journal*, 2003: 1014-1023.

Sturm, R. "The Effects of Obesity, Smoking and Drinking on Medical Problems and Costs." *Health Affairs* 21 (2002): 245-253.

Suhrcke, M, RA Nugent, D Stuckler, and L Rocco. *Chronic Disease: an Economic Perspective*. Oxford Health Alliance, 2006.

Swann, C, et al. *Health Systems and Health Related Behavior Change: a Review of Primary and Secondary Evidence*. National Institute for Health and Clinical Excellence (NICE) and WHO Regional Office for Europe, 2010.

"Tackling the Obesity Epidemic the Impact of Food Trade and Commerce." 2009. <http://72.249.12.201/wordpress-mu/jamaica/?> (accessed February 25, 2010).

Talevani, L. *Middle East and North Africa Gender Overview*. Washington, DC: The World Bank, 2007.

"The Gleaner ." *Smoking Ban Looms* . February 3, 2009. <http://jamaica-gleaner.com/gleaner/20090203/news/news2.html> (accessed June 27, 2011).

The Gleaner . *NHF could collapse - Cash problems loom*, says CEO. 2009 6-September . <http://jamaica-gleaner.com/gleaner/20090906/lead/lead7.html> (accessed June 8, 2011).

The World Bank. *A Note on Disability Issues in the Middle East and North Africa*. Report, Washington DC: The World Bank, 2010.

The World Bank. *Better Governance for Development in the Middle East and North Africa: Enhancing Inclusiveness and Accountability*. Washington, DC: The World Bank, 2003.

The World Bank. *Capitalizing on the Health Transition: Tackling Non Communicable Diseases in South Asia*. Report, Washington DC: The World Bank, 2010.

The World Bank. *Chile: the Adult Health Policy Challenge*. Washington DC: World Bank, 1995.

The World Bank. *Dying Too Young*. Report, Washington DC: The World Bank, 2005.

Dying Too Young. Washington, DC: The World Bank, 2006.

Middle East and North Africa 2007 Economic Developments and Prospects: Job Creation in an Era of High Growth. Washington, DC: The World Bank, 2007.

Middle East and North Africa 2009 Economic Developments and Prospects: Navigating through Global Recessions. Washington, DC: The World Bank, 2009.

Repositioning Nutrition as Central to Development: a Strategy for Large-Scale Action. Washington, DC: The World Bank, 2006.

The World Bank. Sri Lanka: Addressing the Needs of an Aging Population. Washington DC: The World Bank, 2008.

The World Bank. *The Adult Health Policy Challenge*. Report, Washington DC: The World Bank, 1995.

The World Bank. *The economic implications of non-communicable disease for India*. Discussion Paper, Washington DC: Health, Nutrition and Population, World Bank, 2010.

World Development Report 2009: Reshaping Economic Geography. Washington, D.C.: The World Bank, 2009.

Youth - an Undervalued Asset: Towards a New Agenda in the Middle East and North Africa - Progress, Challenges and Way Forward. Washington, DC: The World Bank, 2007.

Thorpe, KE, DH Howard, and K Galactionova. "Differences in Disease Prevalence as a Source of the US-European Health Care Spending Gap." *Health Affairs* 26 (2007): 678-686.

Tobacco News and Information. March 2008. <http://www.tobacco.org/articles/country/antigua/> (accessed 2011 13-May).

Tsounta, Evridiki. "Universal Health Care 101: Lessons for the Eastern Caribbean and Beyond." *IMF working paper*, 2009.

Tuckman, Jo. "Mexico Bans Junk Foods in Schools." *The Guardian*, May 27, 2010.

U.S.Census Bureau, International Data Base. n.d. <http://www.census.gov/ipc/www/idb/country.php> (accessed December 20, 2009).

UK Department of Health. *Change4Life—Eat Well, Move More, Live Longer*. n.d. www.dh.gov.uk/en/MediaCentre/Currentcampaigns/Change4life/index.htm (accessed June 2011).

UN General Assembly. "Follow-up to the outcome of the Millennium Summit: Prevention and control of non-communicable diseases." Vers. Agenda item. 2010 28-April. http://www.google.com/url?sa=t&source=web&cd=6&ved=0CD oQFjAF&url=http%3A%2F%2Fnew.paho.org%2Fbra%2Findex.php%3Foption%3Dcom_docman%26task%3Ddoc_download%26gid%3D981%26Itemid%3D&rct=j&q=Antigua%20and%20Barbuda%20national%20response%20to%20non-communicable%20diseases&ei=-vPTfqGtCtGQfzjri8DA&usg=AFQjCNEF6zWWOVhFn_70rl5CNBKrg8-aQ (accessed May 15, 2011).

UNICEF. *State of the World's Children*. New York: United Nations, 2009.

State of the World's Children 2009. New York: UNICEF, 2009.

UNICEF, and WHO. *Countdown to 2015 Decade Report (2000-2010) with Country Profiles: Taking Stock of Maternal, Newborn and Child Survival*. Washington, DC: WHO and UNICEF, 2010.

United Nations. *World Population Prospects: The 2008 Revision Population Database*. n.d. <http://esa.un.org/unpp/> (accessed September 7, 2010).

UNODC. UNODC. n.d. http://www.unodc.org/pdf/barbados/st_kitts_and_nevis_2002.pdf (accessed May 16, 2011).

Van Beeck, E, G Borsboom, and J Mackenbach. "Economic development and traffic accident mortality in the industrialized world, 1962-1990." *International Journal of Epidemiology* 29, no. 3 (2000): 503-9.

Velasco-Garrido M, Busse R, Hisashige A. *Are disease management programs effective in improving quality of care for people with chronic conditions?* Copenhagen: WHO Regional Office for Europe, 2003.

Victora, CG, et al. "Maternal and Child Undernutrition: Consequences for Adult Health and Human Capital." *The Lancet*, 2008; 371: 340-57.

Vilamoska, C. "Improving Patient Safety: Addressing Patient Harm Arising from Medical Error." *Policy Insight* (RAND Corporation) 3, no. 2 (April 2009).

Vrijhoef, HJ. "Undiagnosed patients and patients at risk for COPD in primary health care: Early detection with the support of non-physicians." *Journal of Clinical Nursing*, 2003; 366-373.

Wagstaff, A. "Measuring Financial Protection in Health." In *Performance Measurement for Health Systems Improvement: Experiences, Challenges and Prospects*, by PC Smith, E Mossialos and S Leatherman. Cambridge: Cambridge University Press, 2009.

Wagstaff, A, and M Lindelow. "Can Insurance Increase financial Risk? The Curious Case of Health Insurance in China." *Journal of Health Economics* 27, no. 4 (2008): 990-1005.

Wagstaff, Adam, and Mgnus Lindelow. "Can insurance increase financial risk? The curious case of health insurance in China." *Journal of Health Economics*, 2008: 990-1005.

WHO. *Chronic Diseases and Health Promotion*. n.d. http://www.who.int/chp/chronic_disease_report/part3_ch2/en/index12.html (accessed May 28, 2011).

WHO. 2004. http://www.who.int/tobacco/mpower/2009/Appendix_VIII-table_1.pdf (accessed April 21 2011).

- WHO. "Alcohol Consumption Country Profile ." 2004.
- WHO. "Global Alcohol Consumption Report." 2006.
- "Global Database on BMI ." n.d. http://apps.who.int/bmi/index.jsp?introPage=intro_3.html (accessed April 12 , 2011).
- WHO. "Global Health Risks: Mortality and Morbidity Attributable to Selected Major Risks ." 2009.
- WHO. *Global Health Risks: Mortality and Morbidity Attributable to Selected Major Risks*. WHO, 2009.
- WHO. *Global Recommendations on Physical Activity for Health*. WHO, 2010.
- WHO. "Grenada – Global Youth Tobacco Survey ." 2001.
- WHO. *Obesity: Preventing and Managing the Global Epidemic* . Geneva : WHO, 2000 .
- WHO risk factors database. n.d. http://www.who.int/topics/physical_activity/en/ (accessed April 14, 2011).
- WHO. "Saint Lucia: Smoking Prevalence Tobacco Economy ." 2002. http://www.who.int/tobacco/media/en/Saint_Lucia.pdf (accessed April 21, 2011).
- WHO. "Saint Vincent and Grenadines: Global Youth Tobacco Use Survey ." 2001.
- "Updated Status of the WHO FCTC: Ratification and Accession by Country." October 29, 2010. http://www.fctc.org/images/stories/ratification_latest_Saint%20Vincent%20and%20Grenadines.pdf (accessed May 12, 2011).
- "WHO Department of Measurement and Health Information." December 2004. <http://www.who.int/healthinfo/statistics/bodgbddeathdalyestimates.xls>.
- WHO. *WHO, Global status report on noncommunicable diseases 2010*. WHO, 2010.
- "World Health Statistics 2008." n.d. <http://www.who.int/whosis/whostat/2008/en/index.html>.
- WHO/AMRO. "Alcohol Consumption Country Profiles." 2010. http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsramro.pdf.
- Wilkins VM, Bruce ML, Sirey JA. "Caregiving tasks and training interest of family caregivers of medically ill homebound older adults." *Journal of Aging Health* 21, no. 3 (2009): 528-542.
- Wilkins, VM, ML Bruce, and JA Sirey. "Caregiving tasks and training interest of family caregivers of medically ill homebound older adults." *Journal of Aging Health*, 2009: 528–542.
- Wilks, R, N Younger, M Tulloch-Reid, S McFarlane, and D Francis. *Jamaica Health and Lifestyle Survey 2007-8 Technical Report*. Jamaica National Health Fund, 2008.
- World Bank. *Development Committee Global Public Goods: A Framework for the Role of the World Bank*. Washington DC: World Bank, n.d.
- World Health Organization. n.d. <https://apps.who.int/infobase/> and <https://apps.who.int/infobase/Indicators.aspx>.
- "Death and DALY Estimates by Cause." 2002. <http://www.who.int/entity/healthinfo/statistics/bodgbddeathdalyestimates.xls> (accessed August 18, 2010).
- Disease and injury country estimates*. n.d. www.who.int/healthinfo/global_burden_disease/estimates_country (accessed December 29, 2009).
- World Health Organization. *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. Report, Switzerland: World Health Organization, 2009.
- Global Prevalence of Vitamin A Deficiency in Populations at Risk 1995-2005*. Geneva: World Health Organization, 2009a.
- Global Status Report on Road Safety*. Geneva: WHO, 2007.
- Global Status Report on Road Safety*. Geneva: WHO, 2009b.
- Global Tobacco Epidemic*. Geneva: World Health Organization, 2009c.
- Jamaica. 2009. www.who.int/nha/country/jam/en (accessed 2010 15-May).
- Jamaica Country Health Profile*. 2008. <http://www.who.int/countries/jam/en/> (accessed June 2010).
- "Jamaica: Global Youth Tobacco Survey." n.d. <https://apps.who.int/infobase/report.aspx?rid=115&dm=8&iso=JAM> (accessed January 20, 2010).
- World Health Organization. *Prevention and Control of Non-Communicable Diseases: Implementation of the Global Strategy*. Document WHA63/12, Geneva: World Health Organization, 2010a.
- World Health Organization. *Reducing Risks, Promoting Healthy Life*. World Health Organization, 2002.

World Health Organization. *The Global Burden of Disease: 2004 update*. World Health Organization, 2008.

World Health Organization. *The Global Burden of Disease: 2004 Update*. Geneva: World Health Organization, 2008a.

World Health Organization. *The World Health Report 2003: Shaping the Future*. World Health Organization, 2003.

“WHO Department of Measurement and Health Information.” December 2004. <http://www.who.int/healthinfo/statistics/bodgbddeathdalyestimates.xls>.

World Health Report 2005: Preventing Chronic Diseases; a Vital Investment. Geneva: World Health Organization, 2005.

World Health Report 2008: Primary Health Care - Now More than Ever. Geneva: World Health Organization, 2008b.

“World Health Statistics 2008.” n.d. <http://www.who.int/whosis/whostat/2008/en/index.html>.

World Health Statistics 2010. Geneva: World Health Organization, 2010b.

www.diabetesatlas.org. n.d. diabetesatlas.org.

